COMMODORE USER

Incorporating Vic Computing

December 1984 Price 85p



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64 DRUM MACHINE

A SIMPLE LISTING

REVIEWS

GAMES DESIGNERS, SPEECH SYNTHS, PRINTER PLOTTER, 5 PAGES OF GAMES

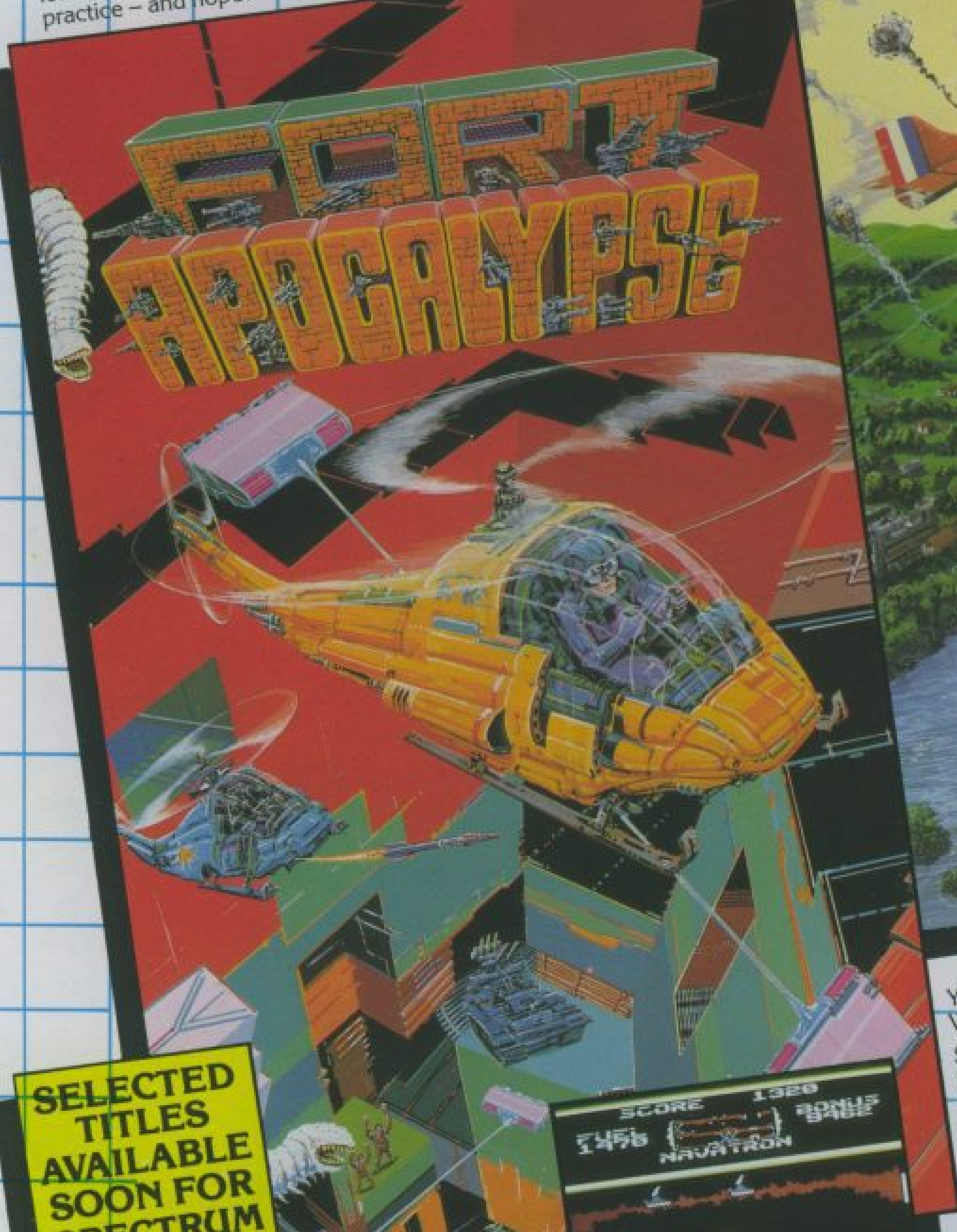
WIN THE ENTIRE TASKSET RANGE

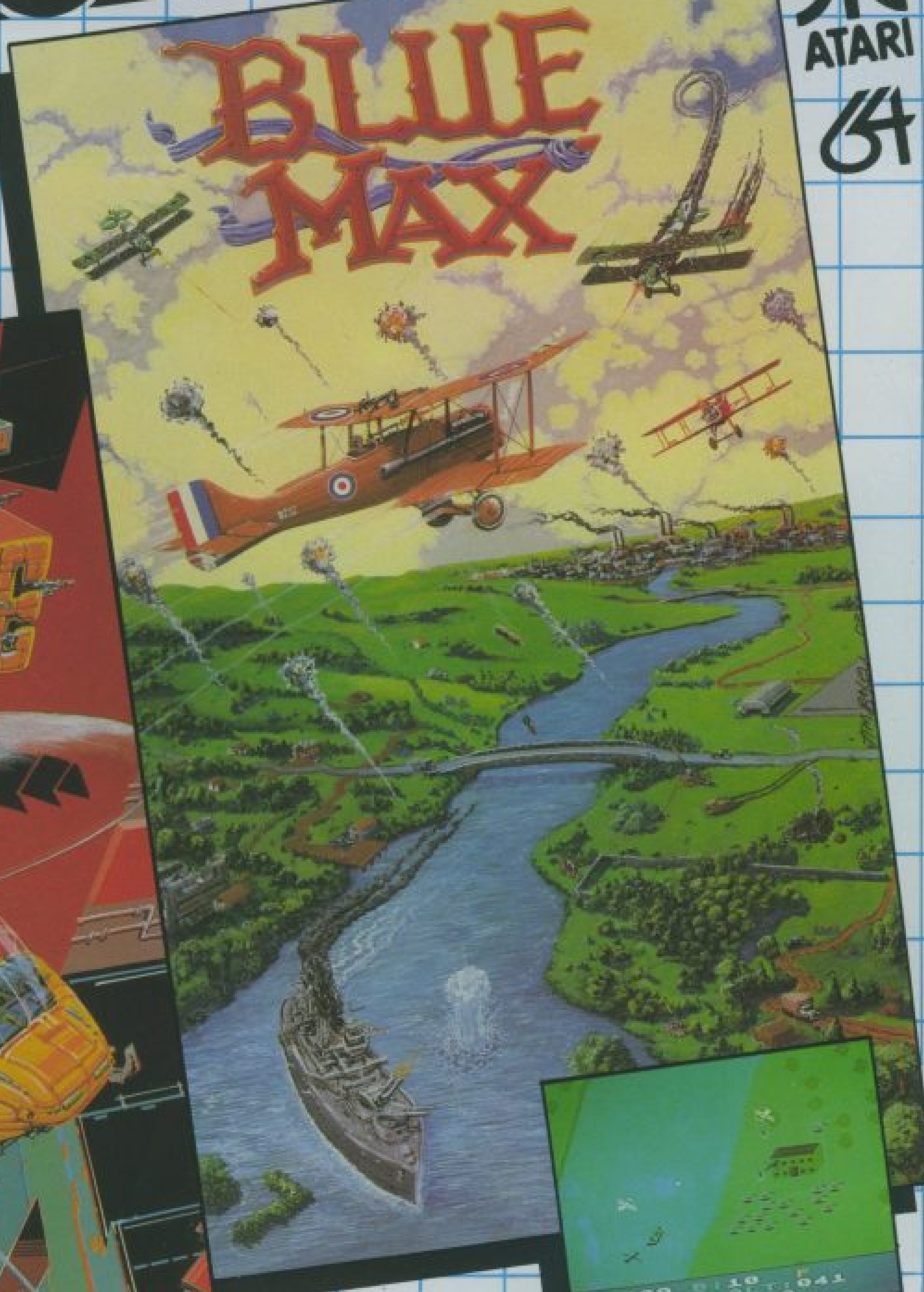
Aerial arcade action from Synsoft

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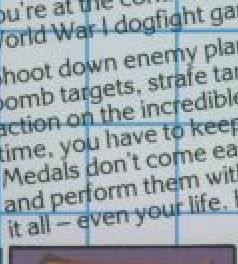
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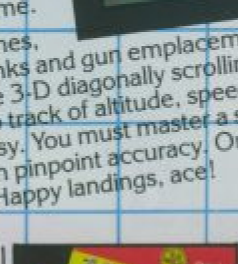
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synsoft



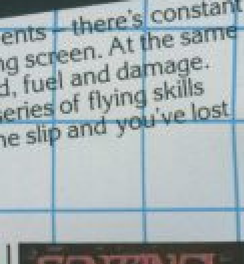
A lively, imaginative alternative to rockets and bombs. Your Drelb builds squares, his enemies knock them down. Quick reflexes, intelligence and strategy are a must.

Commodore 64 & Atari.



One of the most challenging arcade games available! Incredible 3-D graphics, diagonally scrolling screen, super sound – all in great detail.

Commodore 64.

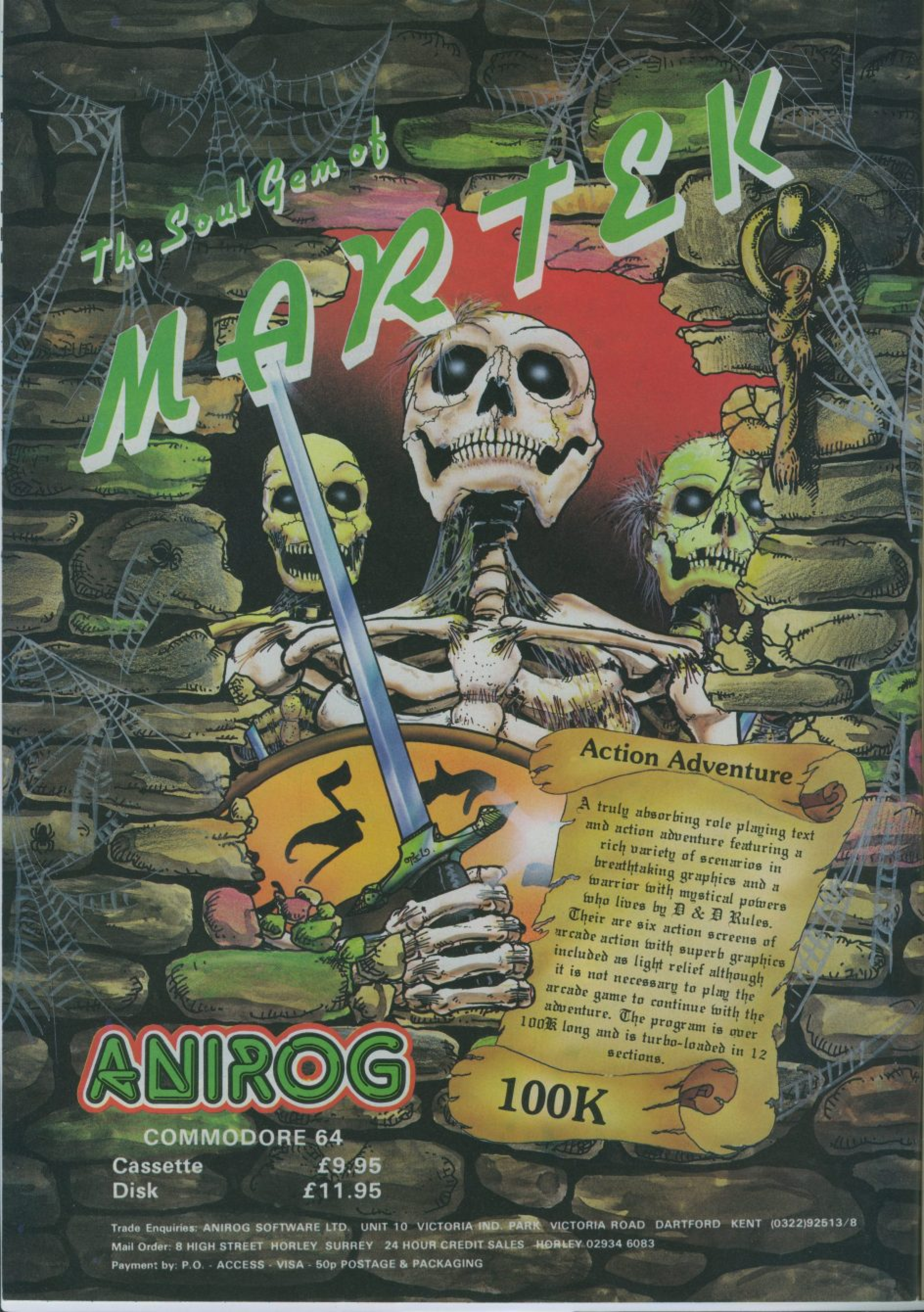


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Commodore 64.



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OUTBACK
COMMODORE 64 and any VIC 20
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"Super graphics, excellent sound and a great sense of humour (5 stars). Home Computing Weekly.
CHOCABLOC
VIC 20 — 8 or 16K
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"Should
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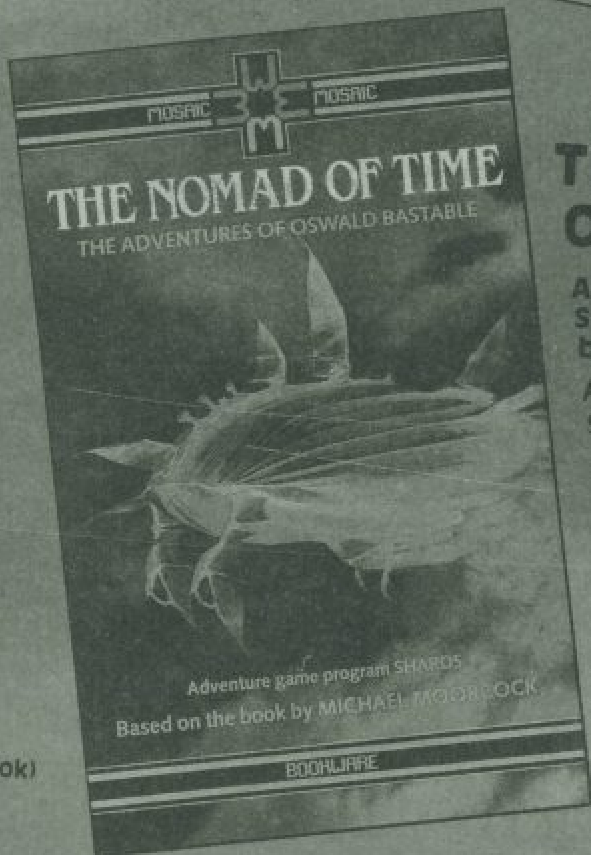


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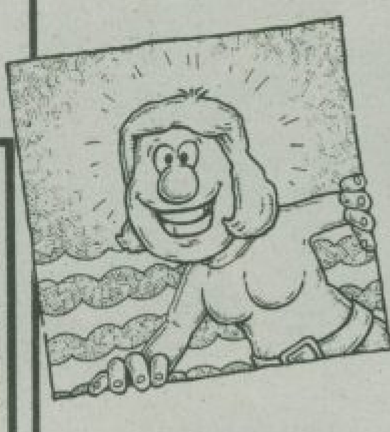
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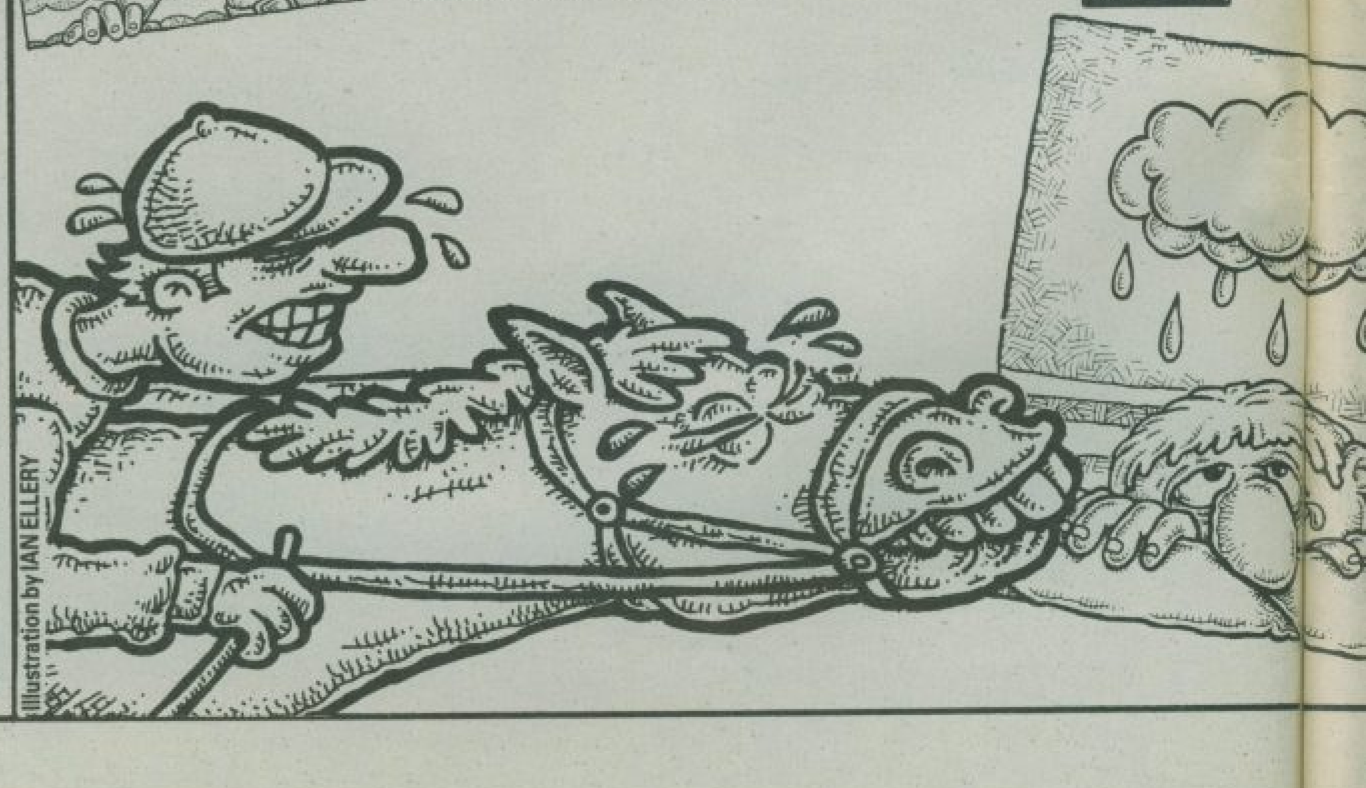


Illustration by IAN ELLERY

Cover Illustration:
Roy Ingram

People

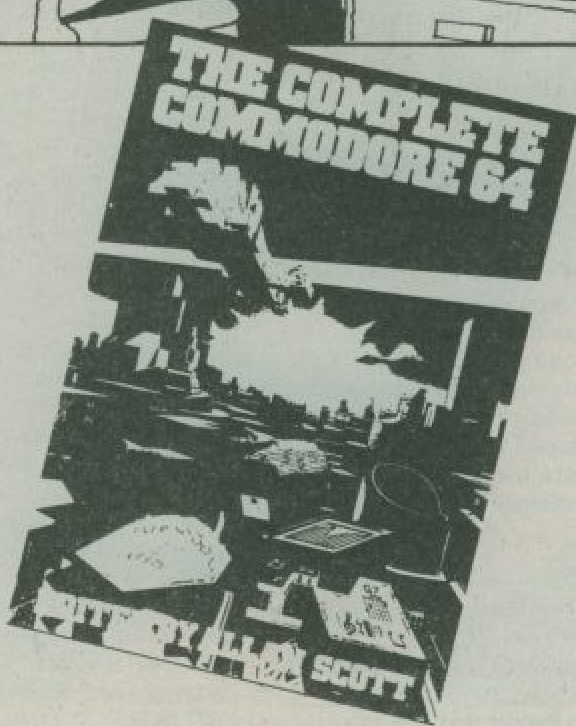
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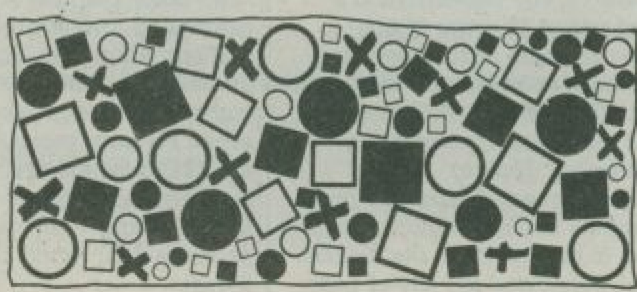


THE COMPLETE COMMODORE 64
SCOTT









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New ways to plot

Datafax has announced a new colour printer/plotter costing a remarkably low £180. But can you use it with your Commodore computer? The answer, as usual, is that you'll need an interface adaptor, as the Sakata SCP-800, as it's ponderously called, has only a Centronics parallel interface. A fairly cheap adaptor may suffice because you'll probably get away with buying a cheap adaptor since you won't be able to produce Commodore's unique graphics. Not even the Commodore 1520 (reviewed this issue) can do that. Still, the price and facilities look like making it a better buy than the 1520.

The Sakata can use paper up to A4 in size, both single-sheet and fed from a roll. It uses 4 colour ball-pens (identical to the 1520's) and, like the 1520, has a range of four character sizes for printing. Print speed for the smallest size is 12 characters per second, deteriorating to 6 per second for the largest.

The plot mechanism is done on an x – y basis with a speed of 57 mm per second across both axes and 81 mm per second travelling diagonally. Accuracy of movement is 0.3 mm maximum. Datafax claims that felt-tip pens will soon be available to allow plotting on an acetate surface for overhead projection. Also being developed is screen-dump software for the Commodore 64. More details on 0256 464187.



The Sakata SCP-800 Colour Plotter/printer from Datafax.

Commodore goes Top of the Form

It's no secret that one of Commodore's ambitions is to make an increasingly large impact on computing in British schools, where the BBC micro still has a virtual monopoly. As part of its "educational offensive" for next year, Commodore has announced that it is to sponsor the 1985 British Computer Society's Computer Quiz.

Similar to TV's Top of the Form programme, the quiz invites schools to produce a team of three children by November (one under 17, one under 16 and a third under 15 years of age) to enter regional heats in which a quiz master bombards each team of boffins with a series of group and individual questions (no conferring, please).

Forty branch finalists go on to compete in eight regional finals who in turn go on to the national final, scheduled for July of next year. Schools will be invited to host rounds of the quiz on their own premises.

What about the prizes? Branch winners will receive a Commodore 64 modem, regional finalists get a Commodore 64 and disk drive each, and the overall winning school will receive £1,600 worth of Commodore computers and peripherals.

If the competition doesn't whet schools' appetites for Commodore computers, Commodore is also running a hardware loan and sponsorship scheme; and that's open whether you take part in the quiz or not. Schools are offered free 64 systems on a three-month loan basis, the idea being that they'll be tempted to keep the equipment. For every £7 raised by the school, Commodore matches it with £3 – sounds like a good idea. More details on 01-637 0471.

Clubbing it for repairs

A new organisation, the Micro Repair Club, has been set up to offer a Repair Package to home computer users when their manufacturer's warranty runs out – for Commodore 64 and Vic-20 owners, that means after one year.

It's quite a simple scheme (surprising it wasn't thought up earlier): you pay an annual subscription fee which guarantees free breakdown repair for your computer. Prices are £24.95 for the first year, with a subsequent renewal fee of £14.95. A four-year cover package deal would cost you £57.95.

So how does it work? The Club itself merely acts as the middleman between an insurance company (Domestic and General Insurance) and a repair company. You simply package up your ailing micro and send it to Computeraid, an independent maintenance company belonging to Thorn EMI. That company underatkes to do repairs free of charge within a week – but there are no written guarantees. If the company can maintain this level of service, users may find it an attractive alternative to paid repairs done by Commodore itself, which aims to return goods within two weeks.

At present, you cannot claim free repairs for breakdown caused by accidental damage. Only breakdown caused by faulty mechanical or electrical parts is covered. The Club claims it's working on this and shortly hopes to offer a supplementary policy to cover accidental damage, fire and theft. Similarly, MRC intends to extend cover to peripherals like printers, disk drives and datasettes – at extra cost.

MRC is not surprisingly eager to push its service in schools, a particularly fertile area for micros, offering a deal of £24.95 per year for the first machine and £19.95 each year for the rest.

Computer retailers are also being encouraged to offer the service to buyers on a commission basis. According to Simon Jamison, MRC's general manager, "offering membership is another selling point that is bound to sway the potential customer". Funny, with Commodore behind you for the first year, why look elsewhere for a repair service? More details from MRC on 01-946 7777.

SHORTS

Bridging the language barrier: *Dunstable software house Kosmos, has just released Commodore 64 versions of its German Master, French Mistress and Spanish Tutor language learning programs. Each language is covered by two cassettes (levels A and B), which provide a learning aid for foreign words, phrases and verbs. Cassettes cost £8.95 each. More details on 05255 3942.*

SHORTS

The 64 from Waterloo: *W H Smith is opening its first Computer Shop inside London's busy Waterloo Station and, of course, you'll be able to buy the Commodore 64 and 16 models there. This sounds like a smart move since an estimated 180,000 travellers pass through the station each day. So if you've got a long wait for a train, what else can you do but buy a computer?*

SHORTS

Calling radio hams: *We'll be running an exciting new series for radio hams early next year. We'd like to hear from any Amateur Radio Society or Club which uses the Vic-20 and Commodore 64. Why not drop us a line? We'd be really interested to hear from you.*

SHORTS

Musicalc discount: *Musicalc UK, distributor of the Musicalc synthesiser package for the Commodore 64 (reviewed last month) is to give a 15 per cent discount to User Groups buying five or more copies, and will lop a hefty 20 per cent off for orders of more than twenty. Sounds good – so does the package. More details on 01-241 2354.*



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AdventureWriter will run on either **Commodore 64**, **Atari** or **Apple II** computers. Demand it from your dealer today! Tell him it's available through Terry Blood, P.C.S., Tiger or CentreSoft. Or order now – fill in the coupon below.



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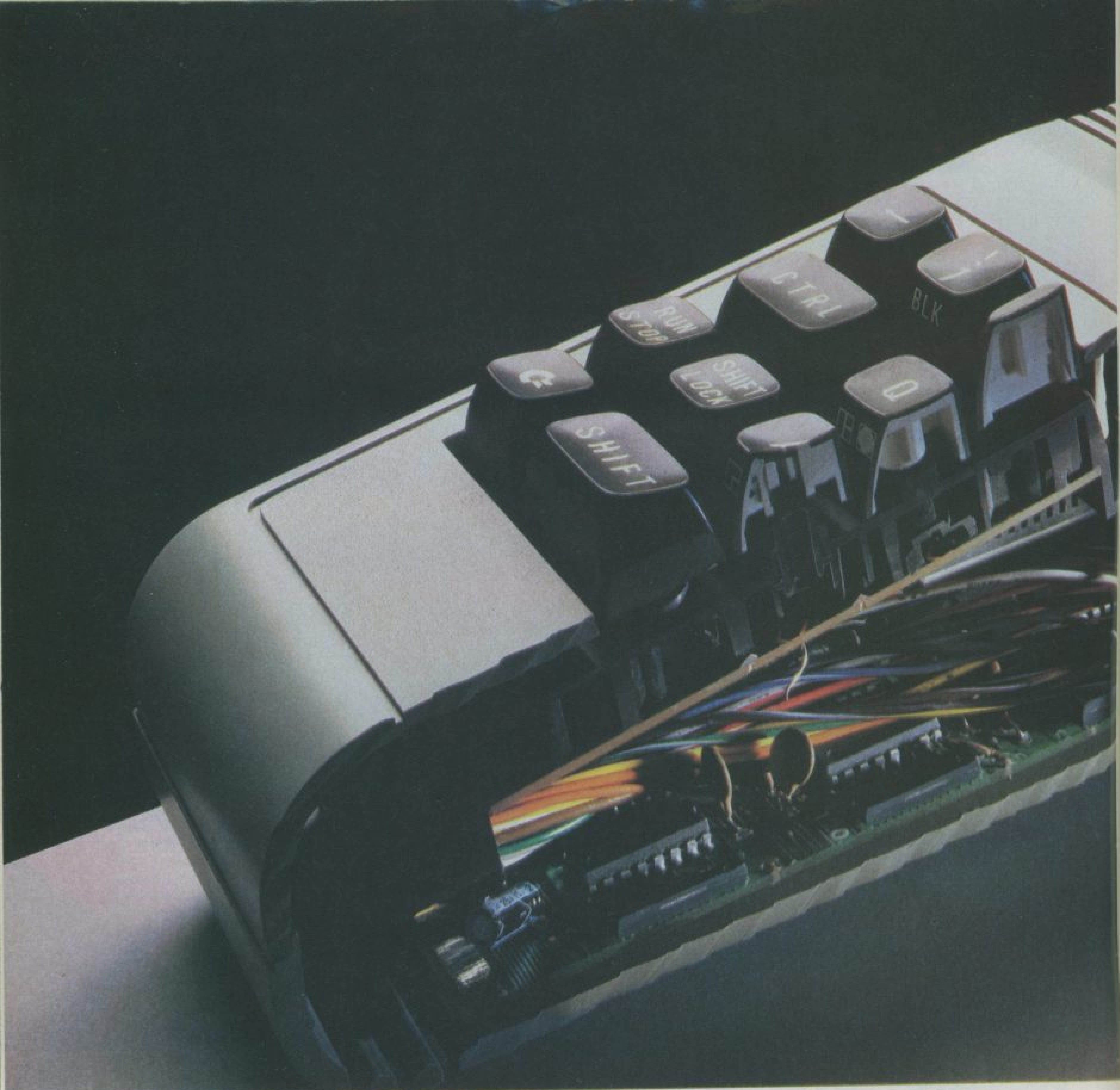
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Are you only using

To only play games on a Commodore computer is like asking Albert Einstein to work out the square root of four.

The computer's brain barely ticks over.

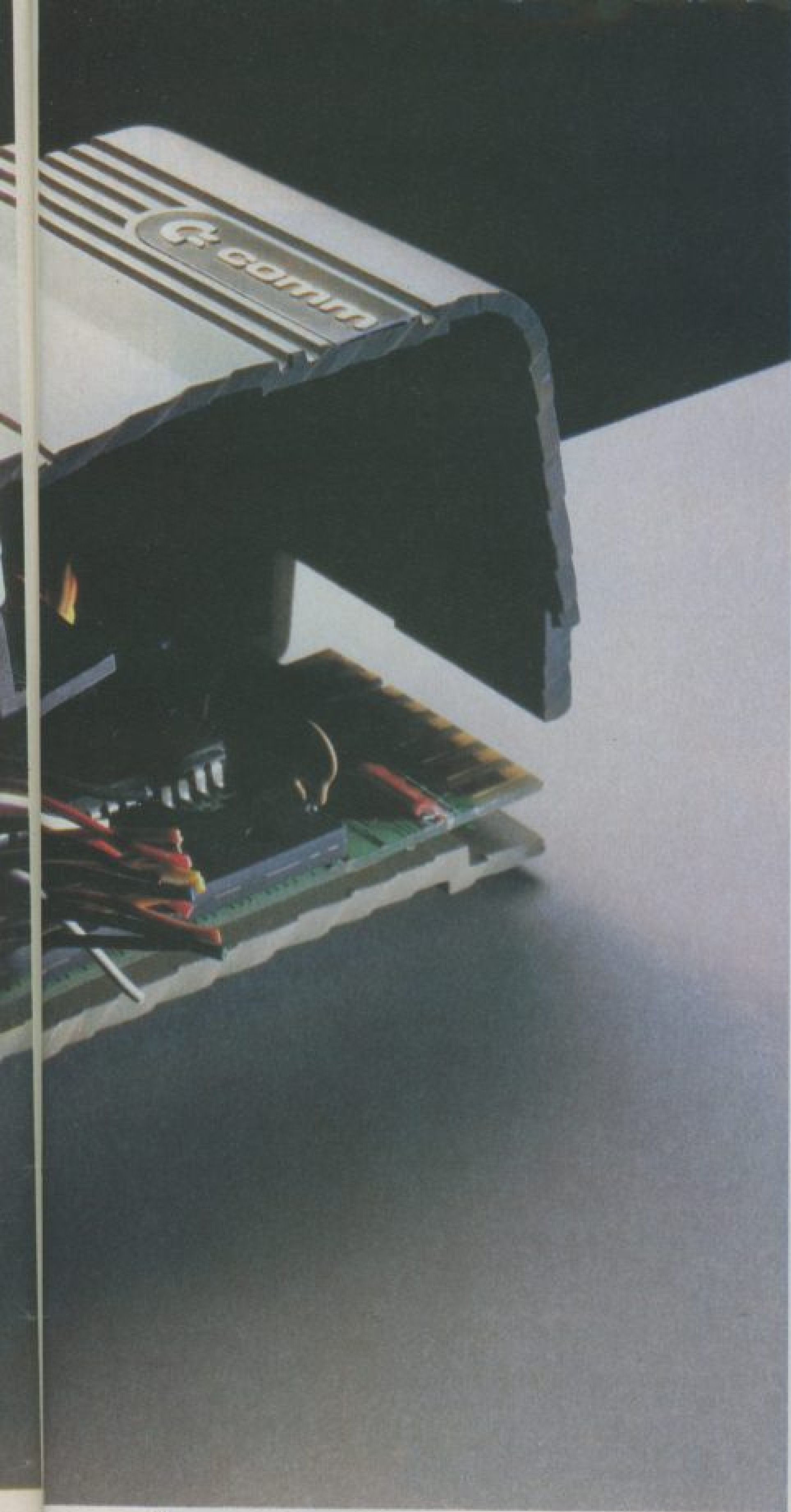
To really stretch it, you need more interesting software programs. For example, record keeping, interactive education, stimulating adventure games or word processing.

And for those you need peripherals.

Like a Commodore disk drive, a really fast storage and retrieval system with a vast memory.

Or a Commodore cassette unit, the inexpensive way of loading and storing programs.

For those who like the idea of text and graphics being more alive and having greater clarity than on a TV, there's the Commodore colour monitor.





COMMODORE MPS801 ☐
Dot matrix printer. £230.00.
Tractor feed. Print speed:
50 characters per second.

COMMODORE MPS802 ☐
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paper. Print speed:
60 characters per second.

COMMODORE DPS1101 ☐
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Letter quality print on
standard paper. Print speed:
18 characters per second.

COMMODORE 1520 ☐
Printer plotter. £169.99. For
charts and graphs. Print speed:
14 characters per second.

COMMODORE 1541 ☐
Disk drive. £229.00.
170K memory. 5¼" diskette.

COMMODORE 1531 ☐
Cassette unit. For Commodore
16 and Commodore plus/4.

COMMODORE 1530 ☐
For Commodore 64.
£44.95 each.

COMMODORE 1701 ☐
Colour monitor. £230.00.

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So use your brain. And make sure you use all of your computer's brain.

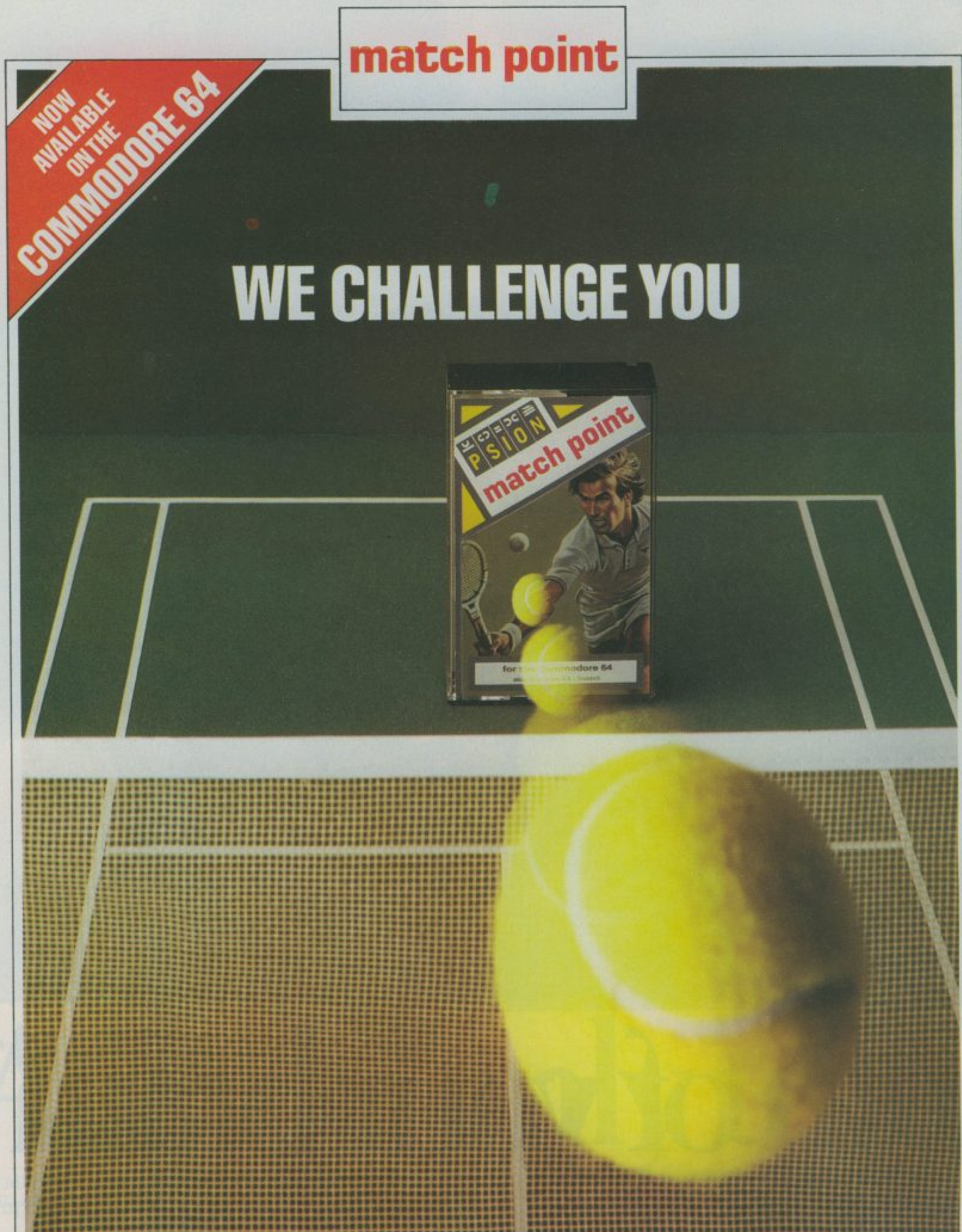
FOR FURTHER INFORMATION, TICK ONE (OR MORE) OF THE BOXES ABOVE AND SEND TO THE COMMODORE INFORMATION CENTRE, 1 HUNTERS ROAD, WELDON, CORBY, NORTHAMPTON NN17 1QX. TEL: CORBY (0536) 205252.

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continued from page 8

Christmas Cards from Compunet

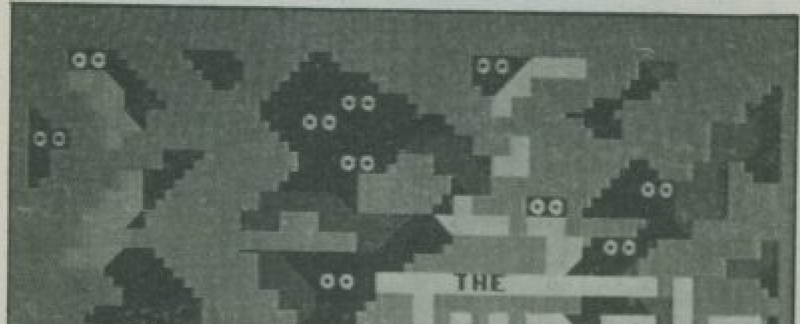
If you're one of the new breed of computer artists eager to find an opening for your work, Compunet may be what you're looking for. The Commodore viewdata company is running a Christmas Card design competition. If you're a Compunet subscriber, you use the modem's edit facility to design an on-screen card, which you then upload to Compunet's mainframe.

The winning design gets £25 and will be included in Compunet's stock of 'Christmas Cards' for subscribers to download. The idea is that you choose a card (actually you're choosing a six-pack costing around 50p, write your message on it using the edit facility, and then 'mail' it to a fellow subscriber. Who needs stamps?

Compunet has another competition to produce the most original frame to introduce one of the viewdata services – there are so many you'll have to check out one of Compunet's advertisements to find one to suit your talents. The winning entry this time gets a Commodore 1701 colour moinitor (runners-up get £25).

If you're not a Compunet subscriber, or don't have access to it, there's still hope. According to Compunet's John Clarke, "non-subscribers will be able to enter the competition by producing their display inside a Basic program and sending it to us either on tape or disk". But you're limited to the Commodore character set and the display must be 23 lines long – Compunet uses the 24th line for text. Entries should be sent to Compunet at Metford House, 15 Clipstone Street, London W1P 7DF.

Can you do better than this?





The first nationwide interactive 'electronic marketplace' for Commodore 64 users.

SHORTS

Koala adds value: *Audiogenic is bundling two more software utilities into its Koala Pad graphics tablet for the Commodore 64. The first, called Koalaprinter, lets you print out on-screen graphics you've created via a Commodore dot matrix printer. But you'll still need an interface adaptor to use a non-Commodore model. Koala Instant Programmer's Guide, the second package, is a set of programs that describe how you can use Koala Pad as an input device in your own programs.*

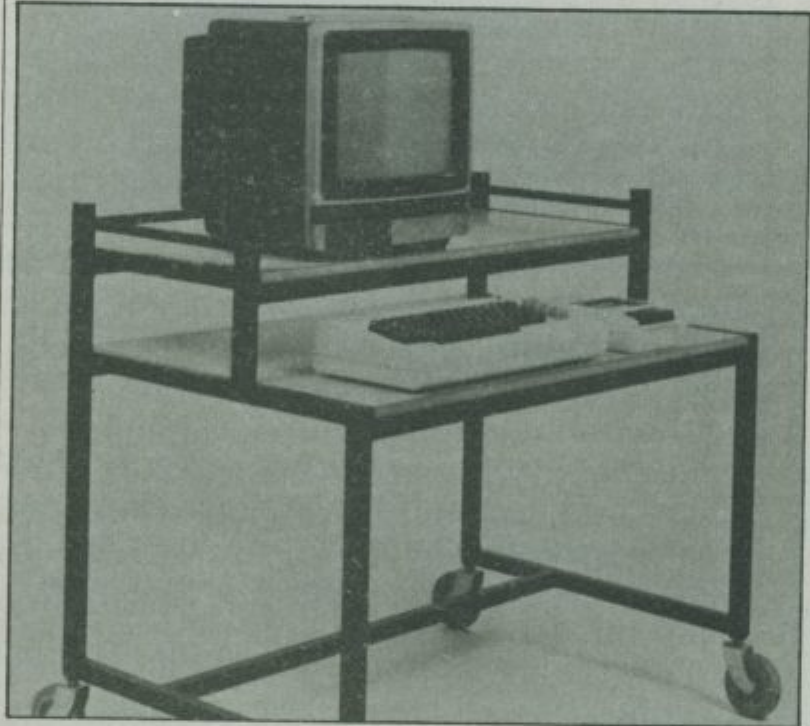
According to Audiogenic, those extra programs are fully documented in the new instructional manual. Koala Pad has now been customised for the UK, providing software to conform with the British PAL TV standard as opposed to NSTC, used in America where the device is made. What all that means, is that circles really do look like circles. Koalapad costs £79.95 and includes software on both tape and disk.

SHORTS

Mastertronic disks: *Several of Mastertronic's games are now being made available on disk. And keeping up its bargain-basement tradition, they'll sell for £5.99 each. Titles now available are BMX Racers, Space Walk, Orbitron, Squirm, Duck Shoot and Vegas Jackpot, not forgetting their latest offering, Chiller. As consolation for the tape-bound, all future Mastertronic cassette games will feature its "burner loading" fast loader.*

SHORTS

Basic on video: *Most people teach themselves programming with a book. But since we're in the Video Age, it's not surprising that a company should come along with a tutorial videotape. The company is Holiday Brothers with a range called Masterclass. Two tapes are available (for both Vic and 64) which take you from the first steps, to advanced programming in Basic. Each tape includes examples of Basic programs on its audio track which you can load into your machine (through a somewhat tortuous route). The tapes cost £19.95 each and are available in both VHS and Betamax formats. More details on 061 437 0538.*



If keeping your computer hardware on the kitchen table causes domestic friction, this mobile computer trolley from EME might be the answer. Originally designed for the educational market, it's sturdily built from tubular steel, with Formica-coated fibreboard shelves. You also have a choice of two heights: 842mm and 660mm. The price? Well, it doesn't come cheap, both models cost around £55 (plus VAT). More details on 0494 26508.

CHRISTMAS S

Christmas time is present time and for many a computer owner that means receiving a useless peripheral that is totally incompatible with your system.

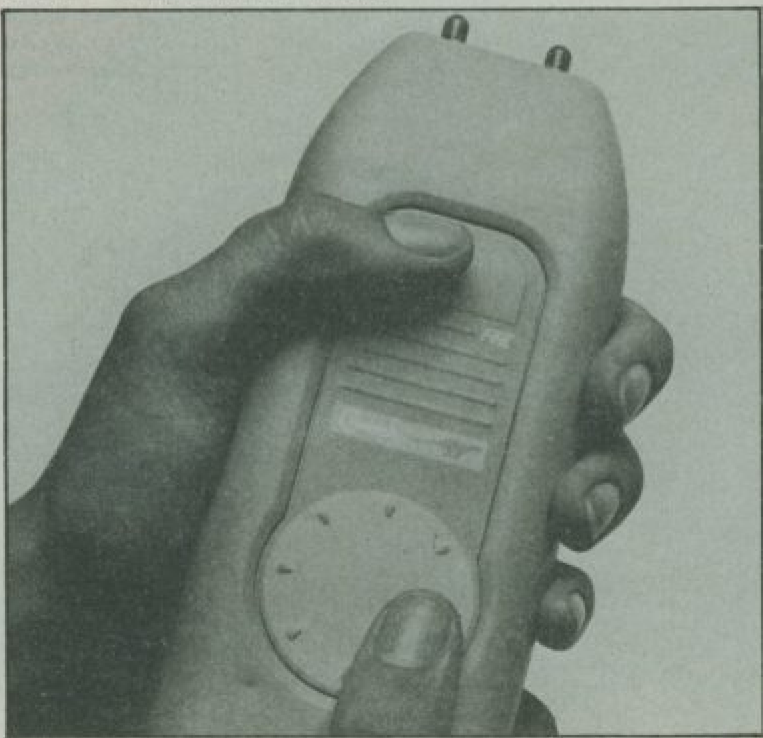
Worse still are the smaller gifts of software packages that you have either already got or do not want.

To give you some idea of the more interesting add-ons and software packages we have drawn up a list.

To get the best results from our Xmas shopping list leave your Commodore User open at this page on the coffee table.

Better still read it in front of your target and occasionally mutter something like "Hmm thats interesting", or "thats useful" – if they still don't get the hint you may as well just come right out and say "I wouldn't be too upset if someone bought me one of these for Christmas".

THE CHEETAH RAT



Look Mum no wires – a new remote control joystick for the Vic and 64 will relegate traditional joysticks to their rightful place in the Science Museum say its manufacturers – Cheetah Marketing.

The Rat is an infra-red action transmitter that works in conjunction with a receiver that plugs into the control port two receiver at the side of the 64. This has been styled in the same colours as the 64 to make the whole thing look neat.

The joystick itself uses a disk controller for direction and is also capable of rapid fire. It requires a PP3 battery and will fit easily into the palm of your hand.

Cheetah claim that the Rat is the fastest controller yet produced for the 64. It can be used up to thirty feet away and has the advantage of letting the player play the game at a good safe distance from the screen.

The Rat is compatible with all existing Commodore software and can also be made to work with your own programs.

You can purchase the Rat from specialist computer shops at £29.95. This could make a good present from mothers who are fed up with joystick leads worming their way around the living room.

PRINT 'N' PLOTTER ADVENTURE PLANNER

Adventure freaks can now make use of a clever adventure solving aid to help them work their way out of the stickiest of situations.

One of the most difficult parts of adventuring is trying to work out where you are at any given time.

Its all very well being a great lateral thinker and solving problems instantly. But if you don't know where the problem is taking you in relation to where you have just been then you are as lost as the next person.

Dungeon-scarred adventurers have long been aware of this problem and have mapped their every move on

TOUCHMASTER FAMILY FUN

The Touchmaster is the latest of the direct-entry devices launched for the 64 that enables you to put graphics on-screen without using the keyboard.

Prutec, the company behind Touchmaster believe that many people are put off using their computer because of a resistance to the key-board. This belief is backed up by a great deal of research currently being conducted in Japan, America, and the UK into the so-called "fifth generation" of computers which will use speech and touch to communicate with the computer.

Touchmaster has a pressure – sensitive A4 work surface and a resolution of 256 x 256. There are no moving switches or dials – graphics are simply painted on screen using the software package and overlay that comes in the box.

Prutec believe the Touchmaster will have many applications outside the home "Commercial and industrial applications for this technology only await the software."

Touchmaster will have its own range of software specially written to run with the system. The first of these will be graphics packages enabling the user to create designs using pre-programmed shapes, board games, arcade games, and adventure games and utilities such as sound synthesisers and graphics editors.

It's likely that the best immediate application of Touchmaster will be in education – particularly for pre-school age children who will benefit from bright overlays and specially written software.

Touchmaster is just one of a number of graphics tablets currently on sale. It is on sale at a slight pricey £149.95.

Other similar graphics tablets are the Super Sketch from Stonechip, Grafpad from British Micro, and Koala Pad from Audiogenic.

Touchmaster – making the computer more accessable





graph paper. Every book on adventure includes the obligatory chapter on mapping.

The Print 'n' Plotter Adventure Planner comprises fifty pages of A3 – that's Daily Mirror size – to plan, and keep a permanent record of the game so far to avoid repeating mistakes and following paths that you have already discovered lead to nowhere.

Each of the fifty pages contains a mapping system with over 150 locations and comes complete with examples and hints and tips on the art of mapping.

The Planner can also be used by people who prefer to write their own adventures to pre-plan the locations.

The Planner is available from specialist computer shops at £3.95 or by mail order at £4.50 inclusive from Print 'n' Plotter Products Ltd, 19 Borough High Street, London, SE1 9SE.

CHRISTMAS SHOPPING LIST

COMMODORE'S MAKING MUSIC

The Christmas tradition of all the family sitting around the piano singing festive songs is about to get a computerised boost thanks to the latest add-on from Commodore for the 64.

You can now sit your family around the 64 and let the computer's three sound channels produce the melodies.

The Music Maker consists of software, a twenty-eight page book of popular songs and tutorial material and a 24 key piano-style keyboard which fits over the 64's keyboard.

The software has eight built-in voices which simulate instruments such as the guitar, piano and synthesizer but all the parameters of each sound can be altered to create almost any sound within the capability of the Commodore 64.

A number of different modes can be selected from the menu including one which creates a range of rhythms from Waltzes to disco, with pre-programmed bass patterns, around which a tune can be created.

For the complete novice tunes can be copied out of the book into the computer. These can then be played back from memory reproducing the key strokes on screen as the tune plays.

Commodore are confident that the Music Maker's £29.95 price tag will make a real winner in the Christmas present market. "The combination of keyboard, software and book will unleash the full music potential of the Commodore 64 for the first time" says the sales blurb.



OLD FOGEYS

Old fogeys have been having a lean time of it recently with all the publicity going to their younger counterparts.

Commodore are determined to redress this balance and have signed up two leading old fogeys to promote their new graphics software utilities.

Tony Hart, old fogey extrordinaire, and presenter of the BBC's 'Vision On' and 'Take Hart' endorses the new Art Master package.

"I was impressed by Artmaster because you don't have to be a computer expert to produce pictures".

Old fogey number two, Rolf Harris, beams out from the box of the Picture Builder which is aimed at a younger age group than the Tony Hart package.

The picture builder enables the user to build on existing graphic characters stored in software.

The utilities are available on disk or cassette at £11.99. Could make a good present for old fogey lovers everywhere.

The silly book business is one of the few booming areas of British publishing, having spawned a host of best-sellers in the last few years.

Not surprisingly the computer book publishers are now jumping on this bandwagon. Well, when you've published a hundred books on the 64 disk drive you kind of run out of things to say about it.

First of the loony computer books is Computer Wimp by John Bear which contains essential information on "computerbabble" – or how to talk to computer people and "Why you need never learn programming". A giggle at £6.95.

Even more looney is the recently published 101 Things To Do With A Dead Computer – suggestions range from yanking the keys out and using it to make ice, growing plants in it, or using it to grate cheese. A few cartoon laughs at £1.95 – more of a stocking-filler than a main present.


Interview
Opportunity Knocks.
This is your big chance – the top programmer's job. All you have to do is be at the right place at the right time.
But don't be deceived, the competition is tough out there!
Due to the complexity of its outstanding graphics and challenging game play, Interview is a multi-load game using the Novaload fast load system on tape.
Don't wait for the rush, Interview is available now from your favourite software retailer or direct from us.
Tape £7.95
Disk £9.95 inc. VAT.
Commodore 64
FRAGILE
To: Front Runner, K-soft distribution, 620 Western Avenue, London W3 0TU
Rush me________Tape(s)________Disk(s) of Interview
Name________
Address________
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I enclose a cheque/PO made payable to K-soft distribution for £________(post free)
or debit my Access/Visa*________
Delete as applicable
I would like to hear news of more Front Runner releases ☐ Yes
Please allow 21 days for delivery.
CU/OI/IT
FRONT Runner
Meet the Challenge

At present Compunet's exclusively for Commodore 64 Modem owners.

It's the most advanced communications system designed for home computer owners.

Because at last your micro can work hand-in-hand with a giant mainframe.

You can upload and download information.

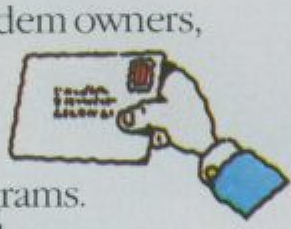
This increased interactivity brings the capacity of large computers into your own home.

You can already communicate with every other Commodore 64 Modem owner.

Shortly the range of services will be boundless.

Read the list. We guarantee you'll be impressed.

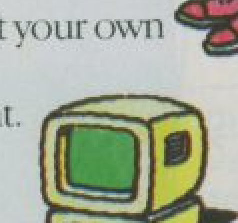
1. Send messages to other Modem owners, even when they're out.
2. Write letters and receive replies.



3. Work together on new programs.
4. Do homework with a friend.
5. Upload and store information and programs at realistic rates.
6. Download data to study later.



7. Stay up to date with new software releases
8. Buy the latest software, from leading companies, at knockdown prices.
9. Ask for advice on programming.
10. Get your programs de-bugged.
11. Find hints and tips on microcomputing.
12. Read all the latest microcomputing news in Compucat.
13. Keep in touch with new peripherals.
14. Find out who's giving the best deals.
15. Download programs directly into your Commodore 64.
16. Save them straight onto disk or cassette.
17. Vote on how good you've found new programs to be.
18. So you'll have a good idea of which programs are the best.
19. Learn how to compose and edit your own pages of information.
20. Advertise unwanted equipment.
21. Swap equipment.
22. Sell your own programs.
23. Also share your programs with other Modem owners.



24. Receive information to help you in your work.
25. Pass on information to other people in your line of business.
26. Download viewdata software.
27. Exchange data files with other 64 Modem owners.
28. Build a school software library.



29. Have access to over 50 free education packages.
30. Like O-level Geography.
31. Or A-level Physics.

Commodore 64 owners w
for a hundred di

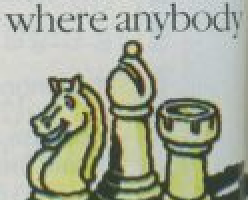
32. And arithmetic for the under-12s.
33. Plus English for all grades.
34. Take a home typing course.
35. And there's up to ten new education packages every month.
36. Start a special interest club amongst like-minded Modem owners.
37. Join a Commodore User Club.
38. Seek advice from Commodore's information service.
39. Talk directly to Compunet, make suggestions or even criticise.
40. Look through the bargains available through teleshopping services.



41. Make great savings on fridges, cookers and dishwashers.
42. Snap up a bargain camera, tripod or flashgun.
43. Advertise cars, household goods or anything you have to sell on notice boards.

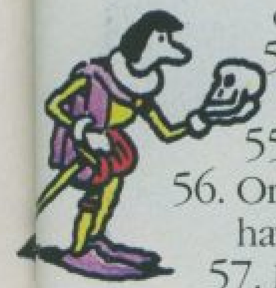


44. Sound out Hi-Fi prices.
45. Print mainframe information on your own printer.
46. Organise conventions with other Compunet subscribers.
47. Compunet's easy to use.
48. Select HELP if you ever get stuck.
49. Explore Compunet's jungle where anybody can display anything.
50. Play games, like chess.



51. All this is available now. Let's see what you could look forward to in the future.
52. Look up travel timetables, for land, sea and air

53. Find out what's showing at your local cinema.



54. Book seats for a night at the theatre, opera or ballet.
55. Have a flutter on the horses.
56. Order your groceries and have them delivered.
57. Make a computer date in complete privacy.
58. Put your finger on a video.



s will welcome Compunet different reasons.

59. Look into what's new in photography.
60. Request an insurance quotation.



61. Check out your bank account.
62. Ask for a bank loan.
63. Choose a restaurant.
64. Discover a new diet plan.
65. Rustle up a recipe.
66. Book a holiday with a major tour operator.
67. Reserve rooms in hotels all over the world.
68. Put your finger on a jeweller.
69. Plan an extension, fitted kitchen, or remodel your bathroom.
70. Seek advice on sowing seasons from expert gardeners.



71. Unearth a garden centre.
72. Dig up a builder, or builders merchant.
73. View a new home.
74. Arrange your mortgage.
75. Hire a car, for business or pleasure.
76. Ask for DIY advice from a professional.
77. Ferret out plant hire companies.
78. Get a quote for double glazing.
79. Find a squash court, keep fit class or gymnasium.
80. Restock your wine cellar, with reputable vintages or promising nouveaus.
81. Send flowers, chocolates and even champagne.



82. Deposit money with a building society.
83. Become a member of a bookclub and enjoy generous discounts.
84. Discover who your favourite soccer team is playing.
85. Track down sporting events.
86. Make a shrewd investment with the help of a stockbroker.

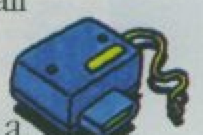


87. Link up with a legal eagle.
88. Find a new job, or advertise a vacancy.
89. Look up currency exchange rates.
90. Shop around for the best store prices in town.
91. Enter big exciting competitions to win massive prizes.
92. See what a recognised astrologer reads into your future.
93. Take part in multi-user adventures.
94. Uncover fresh customers to expand your business.
95. Find a new flat to rent in the area of your choice.
96. Place an order for a new outfit from a mail order catalogue.
97. Search for a new car, tractor, trailer or van.



98. Trace a mechanic.
99. Book a berth on a cruise or charter a plane.
100. And who knows, someday you may be able to book your blast off in a shuttle.

As you can see, Compunet's an all embracing service, with plenty to look forward to.



To take advantage, all you need is a Commodore 64 Communications Modem.

This Modem costs £99.99 inc VAT.

If you order now Commodore will pay your first year's subscription to Compunet–saving you £30.

You can buy a Modem through leading computer shops, or direct from Commodore.

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Please send me more information, an order form and details of my free subscription to Compunet.

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(BLOCK CAPITALS)

Address________________

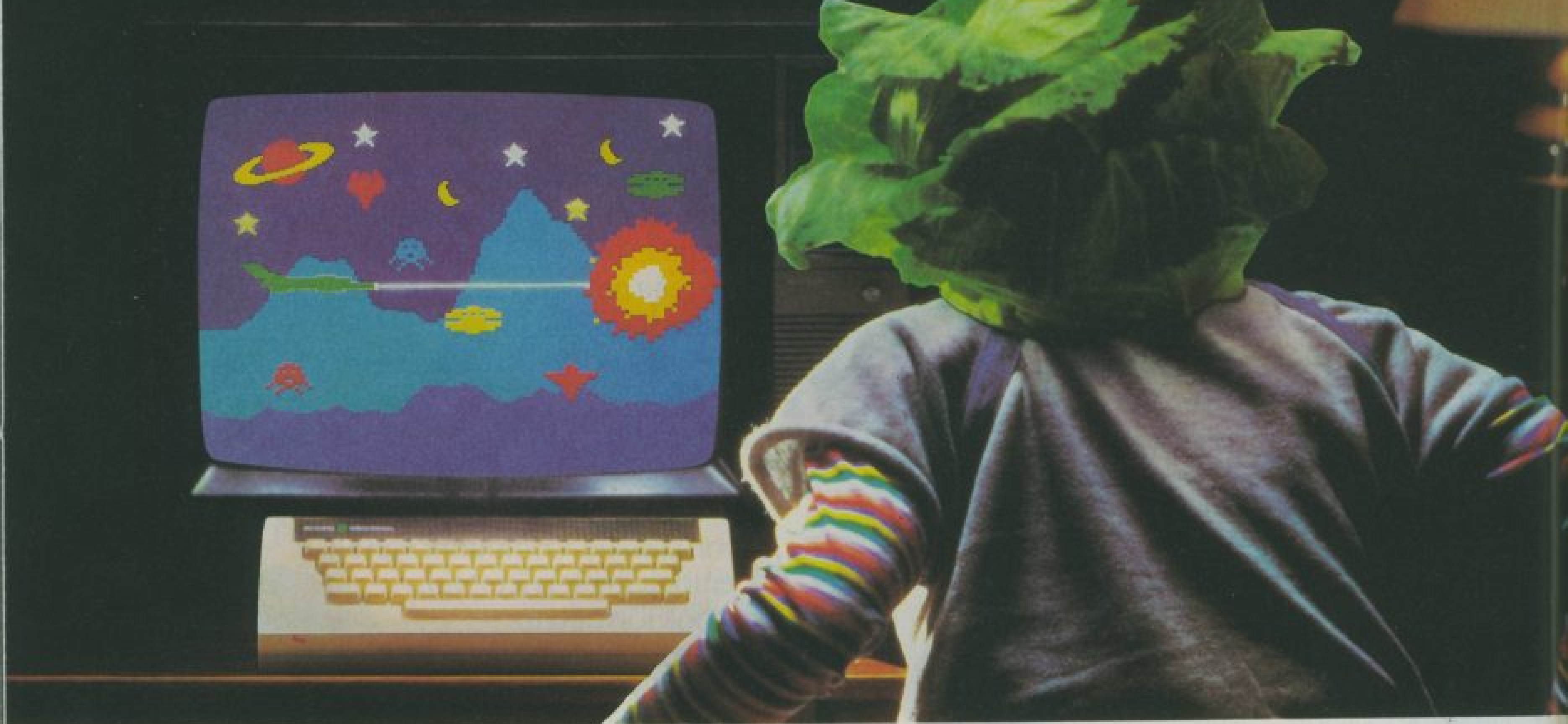
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____________Postcode________

Post to: Compunet Teleservices Ltd, Metford House, 15-18 Clipstone St., London, W1P 7DF

You bought a computer to cultivate your child's mind.

Make sure it's bearing fruit, not growing vegetables.



When it comes to developing a child's learning skills the computer's potential is endless. Unfortunately, the search for software that makes the most of that potential has been endless too.

That is until Spinnaker created their remarkable Learning Tree Series, a unique software range that introduces the one thing missing from most educational programs – fun!

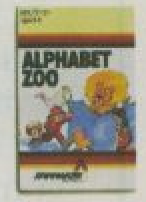
At Spinnaker educators and games programmers write our software. It's a team effort that uses the understanding of how a child learns in a 'fun' way that makes children simply forget they're learning at all.

So successful is the Spinnaker formula that worldwide more parents buy more Spinnaker programs than any other home educational software.

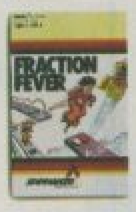
And now, here in Britain, Spinnaker comes to the rescue of parents saddened by the mindless 'shoot to kill' software syllabus.

If you're looking for software that truly cultivates young minds look out for Spinnaker Learning Tree Series.

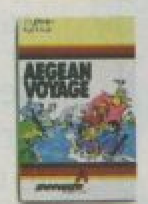
We're proud to say Spinnaker is one software house actually giving computer games a good name.



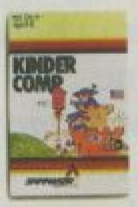
ALPHABET ZOO
A zany two-in-one game that teaches children how to understand the relationship between letters and sounds, how to spell and how to have fun doing it.



FRACTION FEVER
An infectiously exciting encounter with the friendly fraction but with a big difference. This contribution to the third 'R' has all the pace and style of arcade game action and graphics.



AEGEAN VOYAGE
What better introduction to the timeless characters and domains of Greek Mythology. This voyage of discovery leaves your child free to enjoy mind challenging tasks because the imagination is well and truly captured.



KINDERCOMP
In one delightful program six fun learning games that every young child will enjoy. Kindercomp helps develop a child's reading readiness and fundamental counting skills.



KIDS ON KEYS
A three game program that cleverly combines simple 'computer literacy' with early learning tasks. Children learn to identify numbers, letters and words through a sound and image reward.



ALF IN THE COLOUR CAVES
You'll have to be clever to guide Alf on his exciting journey through the colour caves and wriggle, squoosh and zig zag him through the shapes to the colour room at the bottom.

Available from selected W.H.Smith, Claude Gill, Blackwells and all good software outlets. Most Spinnaker software is available for Commodore 64, Sinclair Spectrum 48K, Acorn Electron and BBC-B micros.

For further information contact Susan Hough, W.H.S. Distributors, St. John's House, East Street, Leicester LE1 6NE Telephone: (0533) 551196.

SPINNAKER™
We make learning fun.

Write your own BLOCKBUSTER

Are 'games designer' programs all they're made out to be?

Sooner or later, most Basic programmers are going to try their hand at writing a game. Why not – they've all done it, why can't you? But for the less than obsessive enthusiast, that's a tall order. So a games designer package like Scope, The Quill or Mirrorsoft's Games Creator might be an attractive answer, especially if it 'let's you off' learning machine code. Roger Jones, himself a professional programmer, looks at all three and finds out whether they'll help him make a million – or at least a few bob.

by Roger Jones

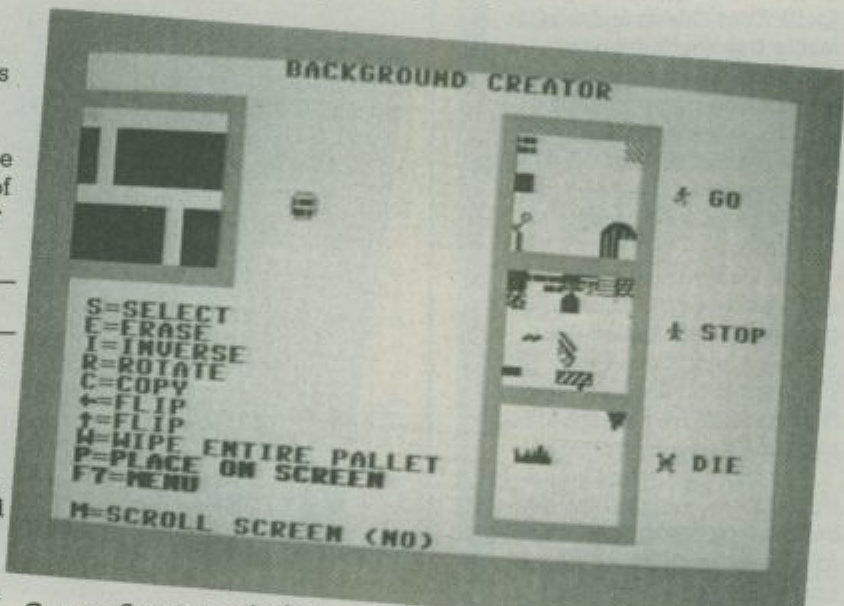
Games designers fall into two main groups, adventure and arcade, but the arcade designers have to be split into two sub-categories, re-designers and pseudo-assemblers. In this article I am going to take an example of each of these and compare their merits and disadvantages.

Scope for design

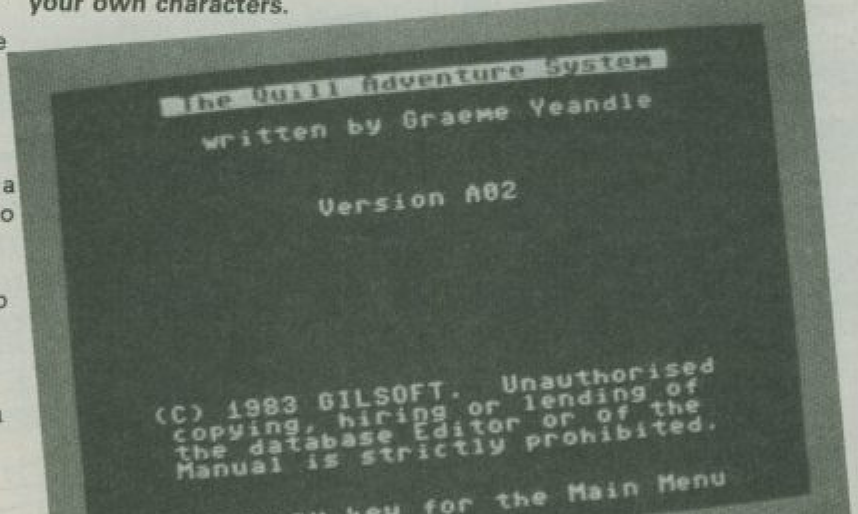
Taking the last type first, one of the best pseudo-assemblers currently available for the Commodore 64 is **Scope** from Codewriter Limited. Scope is an entirely new language dedicated solely to the purpose of games writing. It enables you to construct machine code routines (or at least something like them) which can be run from within a Basic program. It uses Basic-like commands to write the routines and then compiles them into its machine code.

Scope comes in a nice presentation box complete with a comprehensive and fairly easy to read manual which takes you step by step through the 46 command words which make up its language. These command words have to be entered in basic REM statements and the completed Scope routine is then compiled into an area of high memory reserved for it by the main program. Completed routines can be saved to tape for later use with the *tapesave* program included with the package.

Scope is intended for the rapid execution of sub-routines in a Basic program and as such can handle graphics, sprites, colour, sound effects, music and animation but herein lies its weakness as a 'designer'. It is *not* the sort of thing that a programmer with only a smattering of Basic could hope to pick up and create those elusive moneymakers with straight away.



Games Creator – design your own characters.



The Quill – most successful games designer.

In use Scope is as complicated as Basic and a good knowledge of program structure is necessary before any results can be achieved. There is no provision for multi-statement lines so listings tend to be very long and narrow and the interminable printing of REM after every line number is tedious to say the least. The demonstration programs included on the reverse of the tape show some of the capabilities of this undoubtedly powerful language, but that is what it is, a language, and it's not that easy to learn.

At £17.95 it is neither cheap, nor, for what it is, expensive. When I have more time maybe I will learn to speak Scope, but then I might just as well learn machine code itself?

Mirrorsoft's Games Creator

Sticking with arcade designers for the moment, the other sub-category is the *re-designer*. There have been a number of home-produced re-designers around for some time for the Spectrum which allow you to chop Jet Set Willie and company to bits and put them back together in a different shape.

Now from Mirrorsoft comes **Games Creator** for the

Review

Commodore 64. If only that was what it was. When I first heard about it, I thought my quest for a way to write that blockbusting arcade game was at an end, but oh dear me, it was not to be.

For all that, though, Games Creator is still a very good program in its own right. More pretty packaging contains the manual and single tape, which is a fast loader. The manual is written, I feel, to appeal to younger enthusiasts and takes you step by step through the program's capabilities.

But within seconds of reading it though, came the bitter disappointment. Games Creator is not capable of producing games that will run without the presence of the main program in memory.

The tape loads rather unusually; it makes the 64 behave like a Spectrum and you are presented with a title screen whilst the loading takes place complete with multi-coloured flashing lines surrounding it. Very clever, I wish I knew how they did that.

When loading is complete you see a menu page allowing access to the various options for re-designing the game currently in memory. It automatically loaded one sample game with the main program and there are two more on the reverse of the tape. These games are of the platform, maze and good old shoot-em-up types and any one of them can be changed in the minutest of detail.

A la carte options

The menu options allow you to alter the sprites, background, music, sound effects and the rules governing the actions of the player and his opponents or aliens (as the authors describe them). The background can be scrolled or static, but as far as I can tell it cannot be changed within a game to a new scene, even when moving to a new level.

The system for designing the scenery is a little complicated at first glance but very versatile once you've got the hang of it. The music menu is absolutely first class, allowing you to write quite lengthy tunes simply by putting the right note on to the correct stave. Only one minor gripe here, no sharps or flats, which made my version of *Bridge over Troubled Water* sound a bit off in places.

The whole thing can be driven almost completely with the joystick making it easy to use for the little 'uns, but is sophisticated enough to keep us older folks amused as well. Your completed masterpiece can be saved to amuse and astound your friends when they come round, but why oh why couldn't they have gone just that little bit further and make them run on their own?

As it stands, though, it is a very interesting piece of software and, I think, well worth the price tag of £12.95. Mirrorsoft themselves are prepared to buy original Games Creator supported games, with the intention of offering them to owners of the main package, but I somehow feel that this defeats the idea of the program.

Adventuring with The Quill

Now, at last, to the real gem in the list of runners. This next program falls into the adventure game category. It's called **The Quill** from Gilsoft and it is, at last, a true text adventure designer in that it produces a stand alone game (one that doesn't require the host program to be loaded first) of marketable quality without the need for specialist programming knowledge.

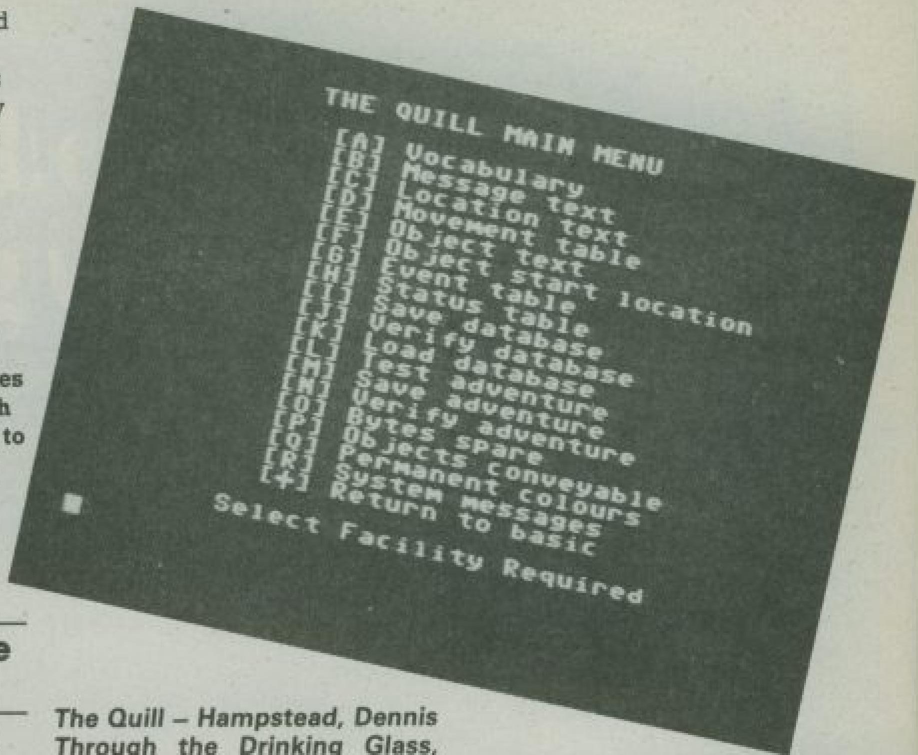
The Quill comes in an unprepossesing black and gold package which belies the excellence of its contents. The program is on a single tape and is supported by an easy to read, two-part manual.

The first part takes you through the construction of a very simple adventure which, if followed carefully, will teach you enough about the program to enable you to tackle the first steps of writing your own adventure game. The second part is a detailed description of the editor, interpreter and database that make up The Quill, forming a clear and concise reference for the serious user.

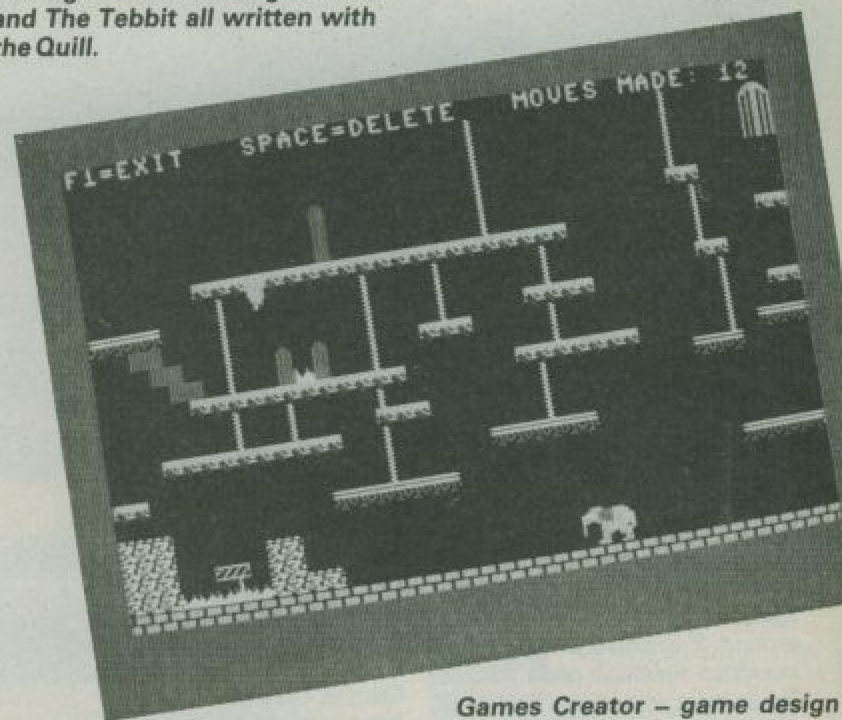
Load and run

On loading the program you see a very complete menu arranged in order of entry, and it's a good idea to have worked your game out on paper first so that the majority of entries can be inserted in this order. Further additions can be made later but it is important to stick to the order of entry as, for example, the interpreter cannot recognise a word if it's not already in the vocabulary.

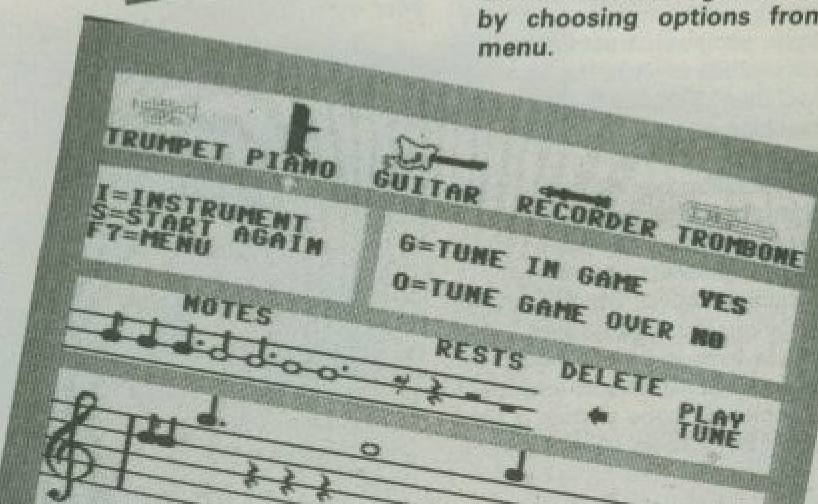
I've found that The Quill can be made to go beyond the limits

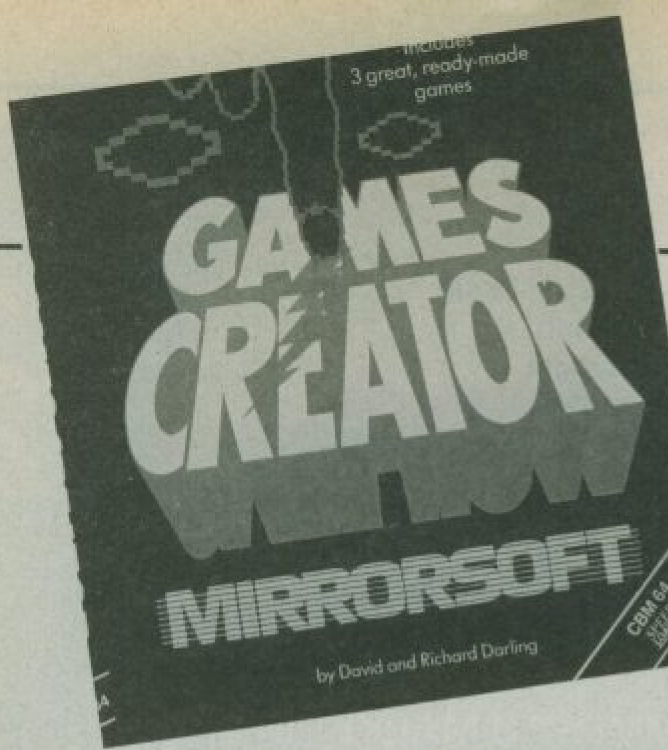


The Quill – Hampstead, Dennis Through the Drinking Glass, and The Tebbit all written with the Quill.



Games Creator – game design by choosing options from a menu.





stated in the manual. Although it is a text-only game designer, you can, for example access some of the Commodore's graphics (by using the CBM key) and with careful use of colours, reversed spaces and letters you can build some very pretty screens and limited pictures.

Playing around with the interpreter in the 'event' and 'status' tables can make some seemingly impossible things happen, such as causing secondary characters in your game to appear in locations other than that occupied by your main character. It is even possible to cause an almost random sequence of events to occur by combining the chance feature with one of the move counting flags.

Your game can be saved to tape at any time as a database, which allows you to re-load it at a later date into The Quill for further work, or as a completed adventure for distribution among your friends or even for sale.

I've been using The Quill for some time now and I market the results. Very generously, the authors of The Quill do not mind you doing this, asking only that you mention their program in your own.

In my opinion, The Quill is one of the most amazing programs I have come across. It does all the authors claim for it and a bit more. It takes the hammer and chisel work out of adventure game writing and leaves you to tackle the more important job of producing a logical and demanding result.

This is not to say that it is easy. The amount of work that goes into producing a respectably sized and reasonably presented adventure game is still, to say the least, prodigious. But The Quill frees you from the confines of Basic and allows your imagination to run free. I cannot praise it highly enough, and at £14.95 it is cheap. Very cheap!

Conclusions

There are, of course, other utilities dedicated to the art of computer games writing and chief among these for the Commodore 64 must be sprite designers. **Pro Sprite** from Dosoft and Mirrorsoft's **Go Sprite** are good examples of these, allowing on screen building and animation of sprites and the compilation of a sprite 'library'. The data statements for the sprites thus created can be extracted for later use in your own programs. But there is no way these can be called games designers and the authors do not claim them to be so.

Still, some software producers allow their advertising to get the better of them. For example, the blurb on the cover of Scope claims it to be 'THE games designer'. Unfortunately it is not. It's a very good and powerful language dedicated to the writing of arcade style games. So why don't they say so – it's nothing to be ashamed of? I'm not knocking the product, just the fact that it is not really what it is claimed to be.

The same can be said for Mirrorsoft's Games Creator. 'The Games Creator is all you need to make your own complete and unique games' claims the advertising. But it won't: there is no way a list of data statements can be called a complete game. Games Creator is a very clever user re-designable game, a sort of mecanno set of the computer. It can be assembled and re-assembled time and time again, but in the end it is still meccano.

Of the three main utilities reviewed here only The Quill is a true games designer. Of course it only produces adventure games, but then that is what it was designed to be. Now if someone could combine the brilliant graphics capabilities of Games Creator with the excellence of The Quill we would really be getting somewhere ...



PICTURE YOURSELF ON T.V.

We're not the only people who think 'Art Master' and 'Picture Builder' are two quite exceptional computer graphics software programs.

Tony and Rolf do, too. Otherwise they'd never have agreed to put their name to them.

With both 'Art Master' and 'Picture Builder' you can create full colour pictures on your own T.V. screen.

And believe us when we say those pictures will match the best computer graphics you have ever seen.

Anywhere.

The pictures are drawn using either the keyboard or a joystick, and can be stored on either tape or on disk.

commodore
COMPUTER SOFTWARE

With 'Picture Builder' you are presented with a palette of 16 colour shades (more than enough for any budding Michaelangelo).

And a collection of character sets totalling over 250 shapes.

So you're hardly stumped for choice.

You simply choose your colours and characters, then 'build up' your picture. Just like any other artist.

With 'Art Master' you again get a choice of 121 colour shades.

But this time you can draw whatever shapes you like, creating your very own high resolution masterpiece from a blank screen.

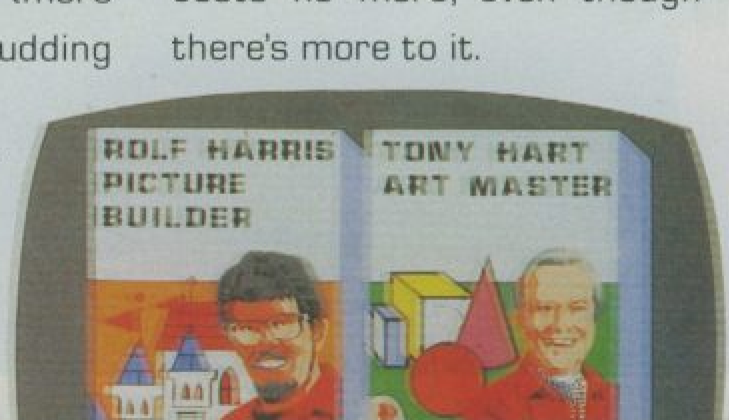
It is even possible to draw circles, and store and then recall a back-up picture – which is more than you can do with other graphics programs.

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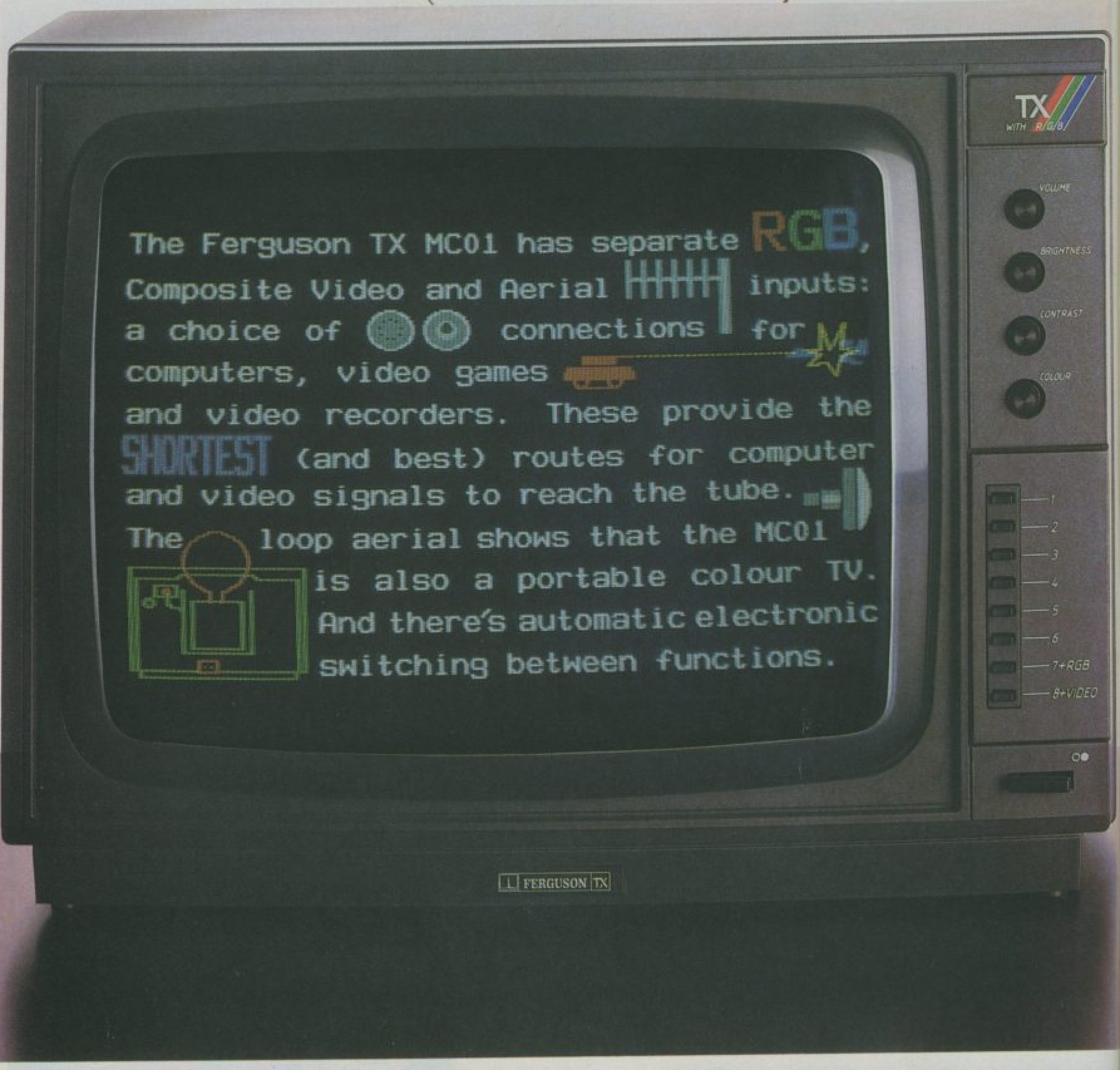
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Commodore 64 Chart

	TITLE	Publisher	Computer
1	**Daley Thompson's Decathlon**	Ocean	C64
2	**Jet Set Willy**	Software Projects	C64
3	**Chiller**	Mastertronic	C64
4	**Beach-Head**	Access/US Gold	C64
5	**Zaxxon**	Access/US Gold	C64
6	**Monty Mole**	Gremlin Graphics	C64
7	**Decathlon**	Activision	C64
8	**International Soccer**	Commodore	C64
9	**High Noon**	Ocean	C64
10	**Summer Games**	Quicksilva	C64
11	**Spitfire Ace**	US Gold	C64
12	**Sub Hunt**	Mastertronic	C64
13	**Football Manager**	Addictive	C64
14	**Quo Vadis**	The Edge	C64
15	**Strip Poker**	US Gold	C64
16	**Valhalla**	Legend	C64
17	**Twin Kingdom Valley**	Bug-Byte	C64
18	**Kokotoni Wolf**	Elite	C64
19	**Flight Path 737**	Anirog	C64
20	**Nato Commander**	Access	C64

CHART UPDATE

Presenting our new look charts page. Commodore User is now publishing the UK's most accurate Top Thirty Games chart by special arrangement with Computer and Video Games and the Daily Mirror. As well as the mixed Top Thirty we will be publishing the Commodore only Top Twenty.

Both charts have been compiled by NOP – the people behind the opinion polls. Watch out for the Top Thirty on Saturday Super Store and the Daily Mirror.

THIS WEEK	LAST WEEK	WEEKS IN CHART	TITLE	Publisher	Computer	SPECTRUM (Available on)	VIC 20	COMMODORE 64	ELECTRON	ATARI	DRAGON	ORIC	BBC	OTHER
1	1	5	**Daley Thompson's Decathlon**	Ocean	Spectrum	★		★						
2	3	–	**Daley Thompson's Decathlon**	Ocean	Commodore 64	★		★						
3	2	3	**Elite**	Acorn	BBC								★	
4	4	3	**Beach-head**	Access/US Gold	Spectrum	★		★						
5	6	17	**Jet Set Willy**	Software Projects	Spectrum	★		★						
6	–	1	**Combat Lynx**	Durrel	Spectrum	★								
7	8	2	**Jet Set Willy**	Software Projects	Commodore 64	★		★						
8	–	1	**Avalon**	Hewson Consultants	Spectrum	★								
9	5	5	**Monty Mole**	Gremlin Graphics	Spectrum	★		★						
10	11	3	**Chiller**	Mastertronic	Commodore 64			★						
11	–	1	**Pyjamarama**	Micro-Gen	Spectrum	★								
12	13	11	**Beach-Head**	Access/US Gold	Commodore 64	★		★						
13	19	2	**Zaxxon**	Access/US Gold	Commodore 64			★						
14	7	3	**Sherlock Holmes**	Melbourne House	Spectrum	★								
15	28	5	**Monty Mole**	Gremlin Graphics	Commodore 64	★		★						
16	–	1	**Decathlon**	Activision	Commodore 64	★		★						
17	–	1	**Football Manager**	Addictive	Spectrum	★		★						
18	12	3	**Kokotoni Wilf**	Elite	Spectrum	★								
19	23	2	**Danger Mouse in Double Trouble**	Creative Sparks	Spectrum	★								
20	29	2	**International Soccer**	Commodore	Commodore 64			★						
21	–	1	**BMX Racers**	Mastertronic	Spectrum	★								
22	–	1	**Tir-Na-Nog**	Gargoyle	Spectrum	★								
23	9	9	**Full Throttle**	Micro Mega	Spectrum	★								
24	–	1	**Battle Cars**	Games Workshop	Spectrum	★								
25	–	1	**High Noon**	Ocean	Commodore 64			★						
26	18	10	**Tornado Low Level**	Vortex	Spectrum	★								
27	–	1	**Summer Games**	Quicksilva	Commodore 64			★						
28	15	11	**Lords of Midnight**	Beyond	Spectrum	★								
29	–	1	**Bouncing Bertie**	Power	Spectrum	★								
30	–	1	**Braxx Bluff**	Micro Mega	Spectrum	★								



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Letter from America
Christmas gifts from the USA
Dan Gutman reports

From his office high up above New York's snow-bound Central Park, Dan Gutman wonders what kind of presents we're all going to buy our computers this Christmas. Stuck for a good idea? Read on. This month, Dan looks at a few American offerings for the 64 that would look good in anybody's Christmas stocking — how about a keyboard that features Kermit and Miss Piggy? But to get your hands on any of them, you'll need to send a truckload of dollars across the Atlantic pretty quickly...

So, what's this about **Mastertronic** snaring 40% of the computer games market over there? Believe it or not, Americans haven't even *heard* of any company called Mastertronic yet. In fact, the only British software company that's recognizable to us is **Virgin** – and that's only because of Boy George. In this age of high technology and telecommunications, it always amazes me how that Atlantic ocean manages to get in the way.

Commodore Wars

Over here, we're all waiting for Commodore's official introduction of their new Amiga "Lorraine" computer. It will probably be announced at the Las Vegas Consumer Electronics Show in January. There's an interesting aside to this story. As you probably know, Commodore and Atari are long-time rivals in the U.S., since the days when the Vic-20 was battling it out with Atari's 400/800 computer. After that, it was the Commodore 64 versus the Atari 800XL. Now that Commodore has purchased Amiga, everybody is wondering what Jack Tramiel and Atari will fight back with...

I just heard a very juicy rumour from the president of a big software company (who shall remain nameless). Atari is going to buy Mindset, a small computer company that has developed an incredible machine with graphics just as astounding as Amiga's. With Commodore owning Amiga and Atari owning Mindset, the stage is set for the next generation computer war – Amiga versus Mindset. There should be more news on this shortly, and I'll let you know what's happening.

Christmas pressies

In the meantime, the old Commodore 64 ain't dead yet. There's a truckload of outrageous peripherals for the machine, and they would make dandy Christmas presents. I'll give you all the addresses of the companies that make them, so you can write away for more information...

● How about a replacement disk drive? As we all know, you could die from old age waiting for Commodore's 1541 to load a program. A company called **Indus** makes replacement drives for the 64, the Apple, and Atari computers. I haven't seen it in action, but they claim the Indus GT is "the most advanced, most handsome disk drive in the world." Just what we need – a handsome disk drive. (*Indus Systems, 9304 Deering Ave., Chatsworth, California 91311*).

By the way, **Datamost** has a new piece of software called "Kwik-Load" which speeds up the 1541 by 300% (*Datamost, 8943 Fullbright Ave., Chatsworth, California 91311*). Is there something about Chatsworth, California that makes people want to improve on Commodore's disk drives?

● **Okidata** has just released a really impressive color printer for the 64 that can produce more than 40 different shades of color and will print on just about any surface – even acetate. The most impressive thing about the Okimate 10 is the price $239 American bucks. That's cheaper than just about any other letter-quality or even dot-matrix printer. (*Okidata, 532 Fellowship Road, Mt. Laurel, New Jersey 08054*).

● **Digital Research** has developed a device that will interface the Commodore 64 and the Pioneer LD700 laserdisc player. It's not on the market yet, but it will be called Vidlink, and it's basically a connector cable plus a cassette or disk software program. Most likely, the first programs for Vidlink will be games along the lines of the arcade game *Dragon's Lair*. In the U.S., laser games in the arcades made a big splash last year, and then sort of died out quickly. But many folks (including this reporter) believe that the *home* is where you hang your laser, and we'll be seeing some home laser games in the near future that will revolutionize this whole crazy industry.

● The Commodore 64 is well-known for it's brain-warping SID (Sound Interface Device) chip music. There are plenty of excellent music programs (*Musicalc* and *Music Construction Set*, to name a few), but who wants to play a computer keyboard and pretend it's a piano keyboard? Now there's a *real* piano keyboard that you just plug into the 64 and the two of them make beautiful music together.

The **Melodian Songbird** is an 18-inch, three octave unit that can reproduce the sounds of up to 16 instruments, including brass, strings and woodwind. It features a built-in metronome, on-screen musical notation, and you can store your music on a floppy disk and play it back any time you like. You can also play a track, play another track on top of it, and play another track on top of *that*, and then listen to them all playing at once. I heard it, and as we say on *these shores*, it knocked my socks off. By the way, the president of the company, Harry Mendell, has done a lot of work with Stevie Wonder, especially on his album "The Secret Life of Plants." (*Melodian Inc., 792 Holmdel Rd., Holmdel, New Jersey 07733*).

● Another new keyboard of interest is **Muppet Learning Keys**, from the same people who make the popular *KoalaPad Touch Tablet*. This one is made especially for kids, and it may be the only computer keyboard to feature Kermit the Frog and Miss Piggy. Instead of having to hunt all over the keyboard for a letter, all the letters in the alphabet and the numbers one through ten are in the right order. The MLK also displays icons of a compass, ruler, eraser and a blackboard on it. Best of all, a kid can smear ketchup. peanut butter, or anything else all over it and the stuff wipes right off. It also comes with some educational software. (*Koala Technologies, 3100 Patrick Henry Drive, Santa Clara, California 95050*).

● Last but not least is an offering from **Commodore.** Have you heard *Magic Voice* yet? It's a speech module that can only be described as cool. Light pens and touch tablets are fine, but there is nothing in this world like hearing your computer talk to you in a human-like voice. The Magic Voice cartridge plugs into your cartridge port. It has a vocabulary of 235 words, all spoken in a very pure and natural female voice. You can slow the voice down and speed it up, and it *won't* sound like the Chipmunks. Commodore also promises additional speech cartridges that will expand the vocabulary and introduce male voices and children's voices. Right now Magic Voice is being used for educational reading games and arcade games like Gorf and Wizard of Wor ("Ha-ha-ha Space Cadet"). But eventually, it will be able to read books to blind people and talk for speech-impaired people. It's really amazing.

SYNCOPATIN

THE 64's DRUM MACHINE

Did you know that there's a rhythm section inside your Commodore 64, and that a little piece of programming is all it takes to get it to rock? It may not be good enough for recording contracts or international stardom but you can certainly have a lot of fun with it. Tom Jeffries starts a new series on aspects of the 64's SID chip. This month, he shows you how to generate percussive rhythms and lists the latest chartbuster from Sidney Sawtooth and the Pulsewaves.

by Tom Jeffries

As you might guess, this rhythm section hangs out in the SID chip. If you've spent much time making music on your Commodore 64, you've probably already met the bass player. With the right waveform and envelope, you can get a pretty good bass sound.

You may not know, however, that if you use the "noise" waveform, you can imitate a drum set. This article will show you how to get a simple rock beat and combine it with a bass line and melody.

When you tell the drummer who is practicing next door to 'keep the noise down', you are not far from the truth of the technical definition of "noise". Noise is a random mixture of all pitches, and is the main ingredient in the sound of drums. In fact, it has become common to add pure noise to cymbal sounds in the recording studio.

The noise output of your SID chip does not sound exactly like a drum, but it gets pretty close. Type in this program below and listen:

The key to making noise sound like percussion instruments lies in the settings of attack, decay, sustain, and release – also known as the envelope, or ADSR. If you haven't worked out these terms before they must seem mysterious, but this program can help you understand them.

Notice that in **line 10** all registers, including the ADSR for voice 2, are set to 0. This clears out any old settings. **Line 20** sets the attack and decay by **POKEing SID+12,18.** Because of the way your computer uses one memory location to set two different things, the actual values that are being set for attack and decay have to be derived with a simple formula. The attack is the number POKEd (that's the number 18 in the example) divided by 16, disregarding any remainder, and the decay is the remainder. The maximum for each is 15, the minimum is 0. This means that we are setting the attack at one and the decay at two – but what does that mean? It means that the sound volume rises to full very quickly, and then falls almost as quickly to the "sustain" level. In this case, the sustain level is 0, so the sound volume drops to nothing. The resulting sound is like a "click".

Try changing the 18 in **line 20** to 22. This leaves the attack at 1, but changes the decay to 6. Now listen to the sound.

Sustaining the attack

The sound volume produced by an orchestral instrument changes constantly in complex ways. Electronic instruments like synthesizers usually have to reduce the complexity to a level that mere machines can handle, so each note is split into a few parts that are controlled separately. The attack, decay, sustain, release (ADSR) used by the Commodore 64 is probably the most common configuration for such controls.

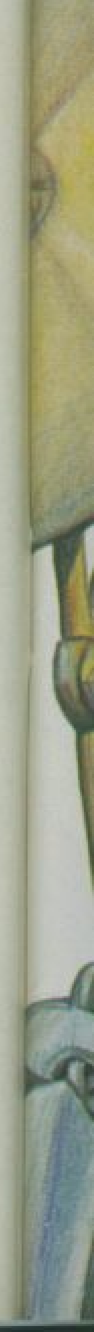
Line 70 changes the ADSR. **POKEing SID+12,38,** changes the attack to 2, which is a little slower, and the decay to 6, which is much slower. Sustain and release numbers are derived from the same formula we used for attack and decay, so **POKEing SID+13,121, sets the sustain level to 7, medium, and the release to 9, medium slow. This combination creates the "cymbal" sound. Try changing the values in line 70** to see how the sound changes.

You can set the speed by changing the TEMPO number in **line 10.** Notice that the timimg loops are set up so that it is possible to fine-tune the rhythm. Basic is slow enough that it is necessary to adjust for the amount of time it takes to execute the POKEs. Actually, if you listen carefully, you'll hear quite a bit of variation in the beat – this drummer needs to practice. Most of these variations can be eliminated with a machine-code driver operating on the interrupt system, but that's beyond the scope of this article.

If you don't understand all of the filter settings (SID+22, 23 and 24), don't worry about it. They aren't crucial. They serve mainly to enhance the other settings. If this program doesn't sound right on your machine, try changing the filter settings, particularly SID+22, the cut-off frequency.

```
10 TEMPO=5:SID=54272:FORL=SIDTOSID+24:POKEL,0:NEXT:POKESID+23,242:POKESID+24,31
20 POKESID+8,6:POKESID+12,18:POKESID+22,140
30 POKESID+11,129:FORX=0TO22*TEMPO:NEXT
40 POKESID+11,128:FORX=0TO22*TEMPO:NEXT
50 POKESID+11,129:FORX=0TO22*TEMPO:NEXT
60 POKESID+11,128:FORX=0TO15*TEMPO:NEXT
70 POKESID+8,16:POKESID+12,38:POKESID+13,105:POKESID+22,200
80 POKESID+11,129:FORX=0TO10*TEMPO:NEXT
90 POKESID+11,128:FORX=0TO75*TEMPO:NEXT
100 POKESID+13,0:GOTO20
```

ILLUSTRATION BY ANNE LYNNE



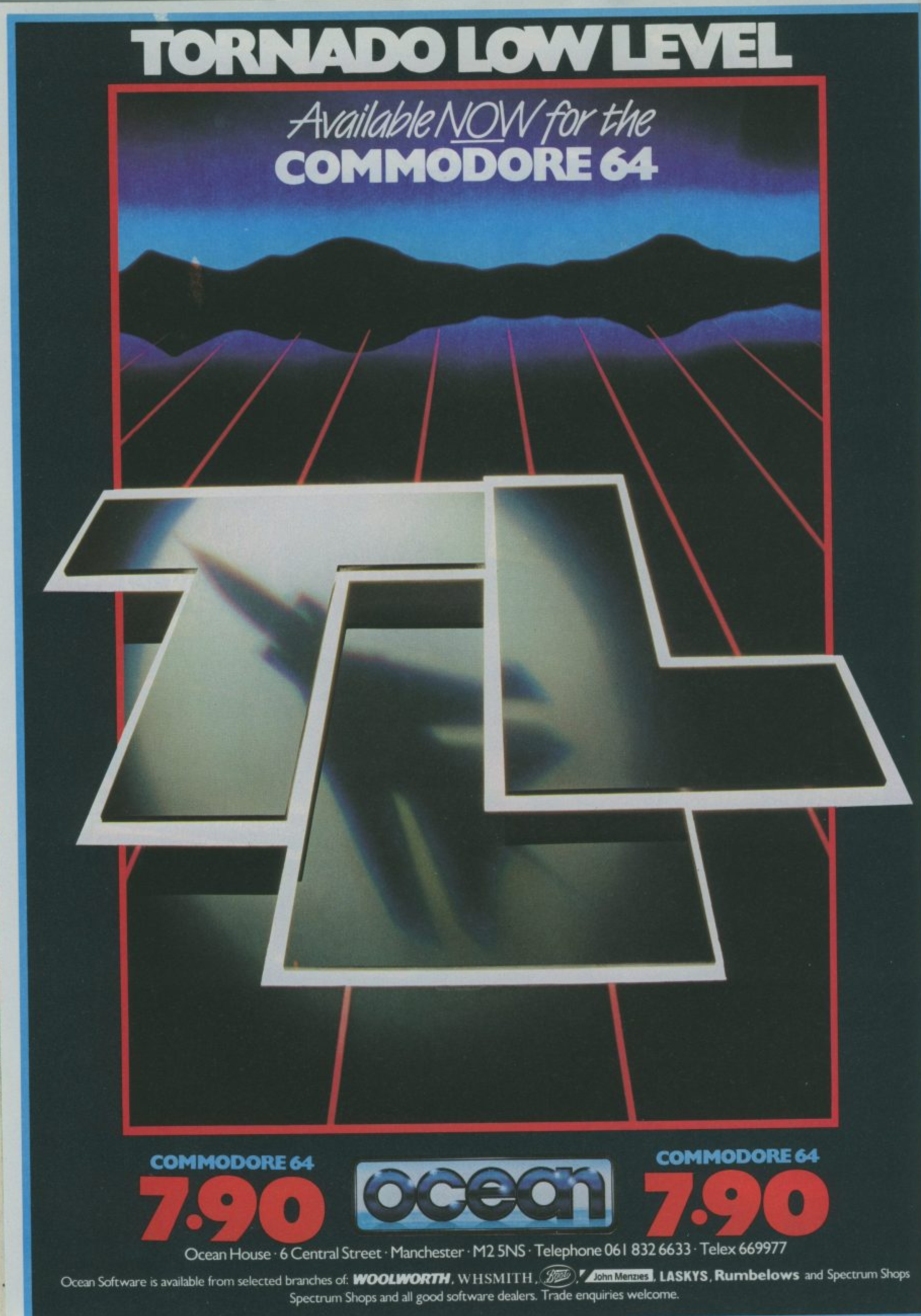
continued on page 38

SID





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SYNCOPATIN SID

continued from page 32

There is considerable variation among SID chips, especially in the filters, so something that sounds great on one machine may not sound very good on another.

White noise

There's one interesting point we haven't covered: the fact that this program specifies pitches for noise, which is supposed to be free of pitch. The truth is that only "white" noise contains all of the possible frequencies. Other versions of "noise" either seem to have some centre of pitch, or exclude some pitches. Commodore has cleverly arranged the SID chip so that we can get a variety of kinds of noises. Listen to the effect of changing the pitch of voice 2 while it is set to the noise waveform:

Line 10 turns on the volume and sets the sustain to maximum. **Line 20** turns on voice 2 and then sets up a loop to increase the frequency one notch at a time. Try changing the "10" in **FOR T=0 TO 10** to **500** to hear more closely some of the sounds produced. You may recognize some of them from some of your favourite games.

Now let's bring the rest of the band onstage:

Of course, you can insert your own DATA lines into this program to teach Sidney and the Waves your own song. **Line 90** initializes the SID chip; you can leave it as it is or set up your own sounds. Trying to explain all of those numbers would take a book, so I'll refer you to one. Appendix 0 of the *Programmer's Reference Guide* will give you lots more information about the SID chip.

Write your own tune

Your notes have their own set of DATA lines starting at **line 500**. Each 1/16 note gets four numbers. The first two give the pitch of the melody note, the second two give the pitch of the bass note. Numbers are entered in low, high format so that, for example, middle "C" would be 195,16. If you want a voice to be silent for a particular 1/16 note, simply type in two 0's, and the note will be shut off.

Make sure that you set the counter in **Line 100**. If you put 16 numbers (four 1/16 notes) in each DATA line, you can simply set the counter to the number of lines. The program will only read the number of lines the counter tells it to, so make sure you put in the right number.

If you are adept at Basic programming, you won't have any trouble coming up with your own drumbeat, either. Just remember that anything too fancy probably won't sound quite right in Basic, so keep it simple.

I certainly hope you have a good time with the band in your computer. You can do some amazing things with the SID chip, so start experimenting! ●

```
10 REM:*************************************************************************
20 REM
30 REM:          "X" as performed by Sidney Sawtooth and the Pulse Waves
40 REM
50 REM:                       (C) 1984 by Tom Jeffries
60 REM:                          ALL RIGHTS RESERVED
70 REM
80 TEMPO=6:SID=54272:FORL=SIDTOSID+24:READV:POKEL,V:NEXT
90 DATA0,0,115,0,0,150,208,0,6,0,0,0,18,0,48,4,0,0,0,52,81,0,140,242,31
100 FORCOUNTER=1TO28
110 GOSUB400:POKESID+4,MELODY:POKESID+18,BASS
120 POKESID+11,129:FORX=0TOTEMPO*10:NEXT
130 POKESID+11,128:FORX=0TOTEMPO*10:NEXT
140 GOSUB400:POKESID+4,MELODY:POKESID+18,BASS
150 POKESID+11,129:FORX=0TOTEMPO*10:NEXT
160 POKESID+11,128:FORX=0TOTEMPO*5:NEXT
170 POKESID+8,16:POKESID+12,38:POKESID+13,105:POKESID+22,255
180 GOSUB400:POKESID+4,MELODY:POKESID+18,BASS
190 POKESID+11,129:FORX=0TOTEMPO*22:NEXT
200 GOSUB400:POKESID+4,MELODY:POKESID+18,BASS
210 POKESID+11,128:FORX=0TOTEMPO*22:NEXT
220 POKESID+8,6:POKESID+12,18:POKESID+13,0:POKESID+22,140:NEXT
230 POKESID,135:POKESID+1,33:POKESID+14,48:POKESID+15,4:POKESID+13,0
240 POKESID+18,33:POKESID+11,129:POKESID+4,65:FORX=0TOTEMPO*40:NEXT
250 POKESID+4,64:POKESID+11,128:POKESID+18,32:FORX=0TOTEMPO*100:NEXT
260 POKESID,190:POKESID+1,59:POKESID+7,31:POKESID+8,21:POKESID+14,97
270 POKESID+15,8:POKESID+5,192:POKESID+12,192:POKESID+19,192
280 POKESID+6,252:POKESID+13,252:POKESID+20,252
290 POKESID+18,33:POKESID+11,33:POKESID+4,65:FORX=0TOTEMPO*500:NEXT
300 POKESID+4,64:POKESID+11,32:POKESID+18,32:END
400 READA:READB:IFA=0THENMELODY=64:GOTO420
410 POKESID,A:POKESID+1,B:MELODY=65
420 READC:READD:IFC=0THENBASS=32:GOTO440
430 POKESID+14,C:POKESID+15,D:BASS=33
440 RETURN
500 DATA0,0,48,4,0,0,119,7,0,0,97,8,0,0,0,0
510 DATA0,0,0,0,0,0,187,3,0,0,0,0,0,0,244,3
520 DATA0,0,48,4,0,0,119,7,0,0,97,8,0,0,0,0
530 DATA0,0,0,0,0,0,187,3,0,0,0,0,0,0,244,3
540 DATA135,33,48,4,195,16,119,7,0,0,97,8,0,0,0,0
550 DATA0,0,0,0,0,0,187,3,0,0,0,0,0,0,244,3
560 DATA0,0,48,4,135,33,119,7,223,29,97,8,195,16,0,0
```

```
570 DATA135,33,0,0,135,33,187,3,223,29,0,0,195,16,244,3
580 DATA135,33,48,4,195,16,119,7,0,0,97,8,0,0,0,0
590 DATA0,0,0,0,0,0,187,3,0,0,0,0,0,0,244,3
600 DATA0,0,48,4,0,0,119,7,135,33,97,8,135,33,0,0
610 DATA223,39,0,0,223,39,187,3,193,44,0,0,193,44,48,4
620 DATA135,33,152,5,195,16,247,9,0,0,48,11,0,0,0,0
630 DATA0,0,0,0,0,0,251,4,0,0,0,0,0,0,71,5
640 DATA0,0,152,5,135,33,247,9,223,29,48,11,195,16,0,0
650 DATA135,33,0,0,135,33,251,4,223,29,0,0,195,16,71,5
660 DATA135,33,48,4,195,16,119,7,0,0,97,8,0,0,0,0
670 DATA0,0,0,0,0,0,187,3,0,0,0,0,0,0,244,3
680 DATA0,0,48,4,0,0,119,7,135,33,97,8,135,33,0,0
690 DATA223,39,0,0,223,39,187,3,193,44,0,0,0,0,48,4
700 DATA60,50,71,6,0,0,48,11,0,0,143,12,60,50,0,0
710 DATA60,50,0,0,0,0,71,6,60,50,0,0,107,47,237,5
720 DATA193,44,152,5,0,0,247,9,0,0,48,11,193,44,0,0
730 DATA193,44,0,0,0,0,251,4,62,42,0,0,62,42,71,5
740 DATA135,33,48,4,195,16,119,7,0,0,97,8,0,0,0,0
750 DATA0,0,0,0,0,0,187,3,0,0,0,0,0,0,244,3
760 DATA0,0,48,4,135,33,119,7,223,29,97,8,195,16,0,0
770 DATA135,33,0,0,135,33,187,3,223,29,0,0,195,16,244,3
780 DATA135,33,48,4,0,0,0,0,0,0,0,0,0,0,0,0
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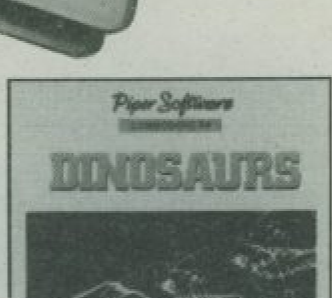


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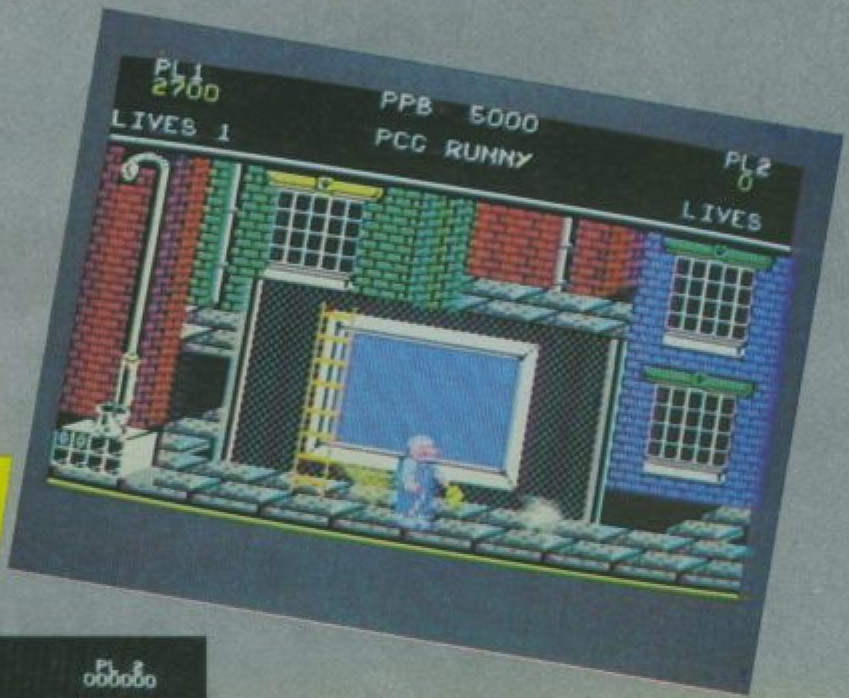
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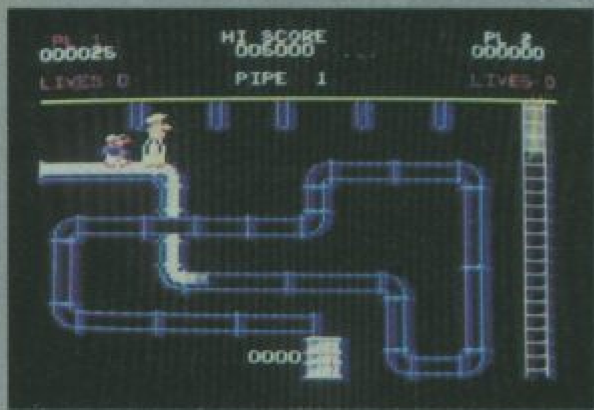
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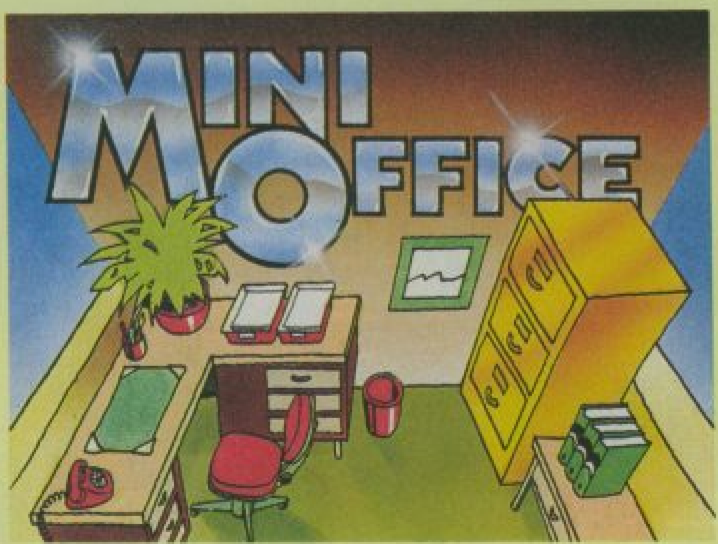
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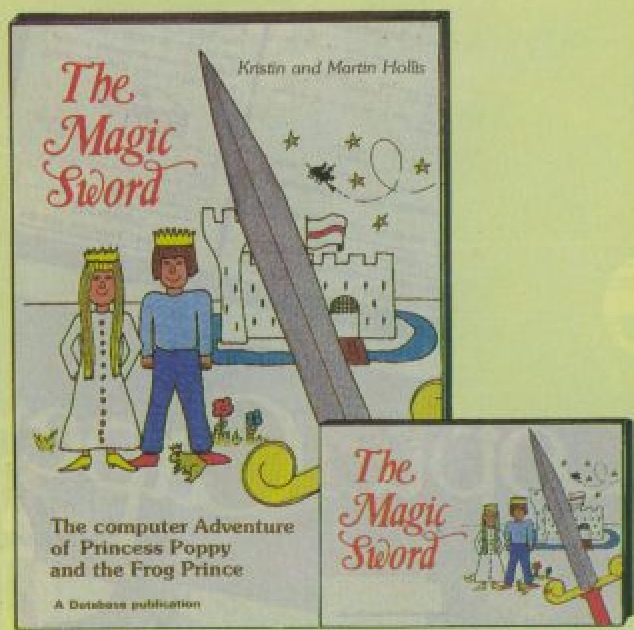


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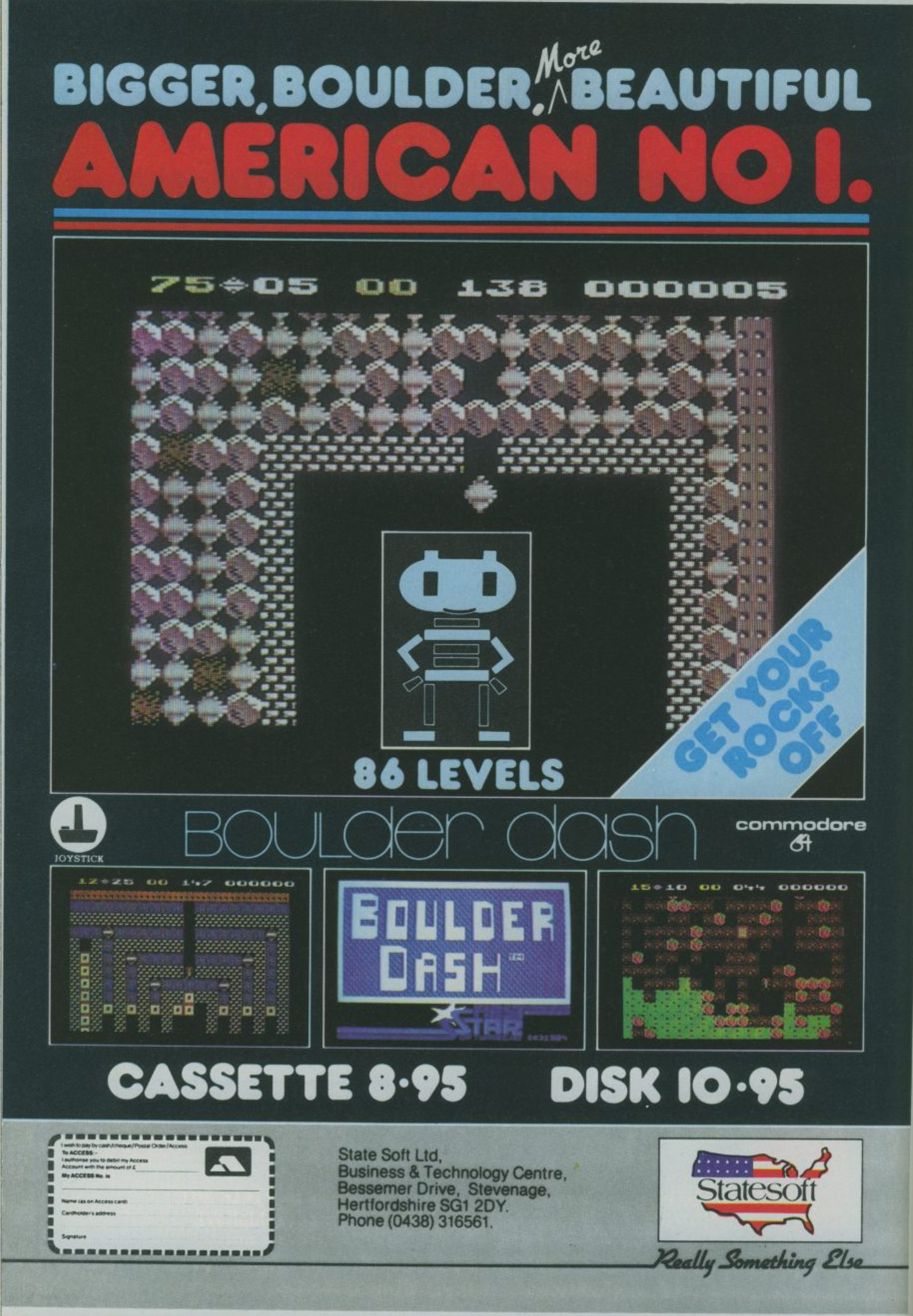
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continued on page 47

User friendly design — PART THREE

Improving data entry

by Chris Preston

Now we come to the central theme of our series on user friendly program design: the best way of arranging the actual data entry section of the program. We will base this article on an imaginary data entry section for a program that sets up and maintains a file of records, but the principles apply to any other data entry application.

The screen for the data entry 'Form' consists of a number of *fields*. Each of them has rules about what characters may be entered and how many of them. A cursor is displayed to show the user exactly where he or she is on the screen, the program allows you to enter and edit data, and to move from field to field – ideally, with the greatest of ease in both cases.

```
ACCOUNT NO ------------------------------------------
SURNAME ---------------------------------------------
INITIALS --------------------------------------------
TITLE -----------------------------------------------
ADDRESS ---------------------------------------------
-----------------------------------------------------
-----------------------------------------------------
-----------------------------------------------------
POST CODE -------------------------------------------
ANALYSIS CODE ---------------------------------------
CREDIT LIMIT ----------------------------------------
```

All the details entered from the screen are stored in a file that can be used by other programs in the suite. The analysis code, for example, may be used by a separate printing program to allow the operator to print labels for everyone living in Hertfordshire who has expressed an interest in photocopiers.

The operations to be carried out on the file are:

- **Enquiry**
- **Amendment**
- **Insertion**
- **Deletion**

The first thing to do is to enter the account number of the person whose record we want to look at. Once the operator has done this, the program decides whether the record is already on file.

How it does this exactly is beyond the range of this article; maybe we'll cover that another time. But assume that the record *is* found: the details should be put on to the screen, and a message should be displayed in the status line something like this:

PRESS (A) TO AMEND; (D) TO DELETE; OR (SPACE) TO ENTER NEXT CODE

This gives the user the chance to examine the data before deciding what to do. Programs which ask whether the



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continued from page 45

operator wants to delete a record or amend it before the operator has seen the data are expecting you to take a shot in the dark; never a good idea.

If you press (D) for delete, the program should ask you to confirm this.

DELETE RECORD? PRESS Y OR N

Don't forget that the program should accept (y) as well as (Y).

If the user presses the (SPACE) bar to signal that he or she wants to look at another record, the cursor should be returned to the account number field (which should not be blanked). The operator may only want to change one character ('A1430' to 'A2430' for example), and we don't want to make the poor sod re-enter the whole field.

Browsing

At this point it's always a good idea to allow the user to move backwards and forwards through the file – say by using the (and) keys – to look at each record in turn. This 'browsing' facility is in fact essential where the key is not unique, as would be the case if we used the surname as a key instead of the account number – there are quite a few Smiths in the telephone directory!

Here we might be better off using the initials as a secondary key. That way, if the operator enters an initial, the program will search for 'J Smith' or whatever; but if no initial is entered the program searches for the *first* 'Smith' on the file.

The problem with using initials is that people often leave out their second initial. We might have records on the file for 'J Smith' and 'J A Smith' which in fact refers to the same person.

We are now getting quite deeply into the subject of 'system design', which is not really what the series is about. But this does show that even a simple data entry exercise like this one can be fraught with complications that appear only when the matter is studied in depth. There are many problems involved with using names as identifiers, and this is the reason why computer systems nearly always use codes of some sort instead.

On with the show. Pressing (A) shows that you want to amend the data held on file. The status line should be cleared (that should always happen once a prompt has been obeyed) and the cursor positioned over the first field in the body of the screen, which in this case is the SURNAME field.

But before going on to the actual data entry operation, we must just quickly look at what happens if the record requested was not already on the file. If the record does not already exist the user may want to add a new record. Or you may have mistyped the key. Either way the program has to ask for more information:

RECORD NOT FOUND. PRESS (I) TO INSERT OR (SPACE) TO RE-ENTER CODE

The (SPACE) bar returns the cursor to the surname field ready for a new key to be entered, once again witrhout blanking the field.

If (I) is pressed then the cursor is moved down to the SURNAME field, ready for data to be entered. Here though, we can possibly ease the operator's task. A lot of data entry is repetitive; a field contains the same or similar information on many records in the file. To save the operator time and effort it is often best to leave the data from the previous operation on the screen; as we will see shortly, using a well-designed data entry scheme, editing is no problem.

If the insertion is the first operation in the day, have some built-in defaults which you can display. For example the company may have a 'standard' credit limit for its clients of £1000, so put 1000.00 in the CREDIT LIMIT field ready for the operator. That way, if the default value is correct he or she just has to press the (RETURN) key to accept the data. This is just our philosophy of making things as easy as possible for the operator.

Of course, we cannot have any default for a name field. But leaving the previous record on the screen with *its* name field can act as a kind of prompt.



Control keys

Now at last we come onto the *real* data entry side of things. Our aim is to make life as simple as possible for the operator. To do this we have too implement a *complete* set of editing keys: data entry systems where the only control allowed is a "DELETE" key which deletes the previous character are not uncommon, but really they aren't worthy of the name.

Before coming on to control keys though, let's consider 'normal' data entry – where the user enters the correct data without having to do any editing.

First of all, he or she must be told how many characters can be entered in a field. This could be done by displaying a character such as a hyphen to show each available character position. As data is entered, these are overwritten; so when the cursor gets near the end of the field, you can see immediately how many spaces you have left. When the field is full, a beep should be given and the key ignored if you try to enter any more characters.

Some fields have restrictions on the characters which can be entered. Numeric fields obviously only allow the digits 0 to 9, the decimal point and the minus sign. Other fields may only allow Y and N, or some other combination of letters. In fields such as these pressing any illegal key should again produce an immediate beep and maybe an explanatory message.

In numeric fields we also have the restriction that we can only have one decimal point or minus sign; and that minus sign *must* come before any digits. Numeric fields are also somewhat strange in that the data in the field will be right – justified when the cursor comes into it, but the operator will want to start putting in data from the *left-hand* end of the field. There are two ways of handling this. The cursor can be placed over the leftmost position in the field, rather than at the first character of the field.

If the value in a numeric field is being changed at all however, it is probably being changed completely. So there's a case for saying that the cursor should appear in the first character position as normal, but if the operator tries to edit the field (by pressing any key other than Next Field, Previous Field or RETURN) the field should be *completely* cleared. This looks a bit drastic, and it does tend to startle an inexperienced user; but it's not as bad as it sounds – as once the operator has got used to using a computer, he or she will tend to re-enter short fields completely in any case, without bothering to use the editing keys.

Now for the control keys:

- *Cursor Left and Cursor Right:* these keys allow you to move the cursor around within the field. If you try to move outside the field, the computer should beep and ignore the key.
- *Previous Field and Next Field:* the normal cursor up and cursor down keys can be used to move the cursor between fields 'up' taking you to the previous field, 'down' moving to the next one. The RETURN key also takes you to the next field, and will of course be the key normally used for this purpose.

If the user quits the last field on the screen, we can assume that data entry is complete and ask if he or she is satisfied with the data. If 'PREV FLD' is pressed when the cursor is in the first field, the program should beep and the key should be ignored.

- *Insert and Delete:* the user should be allowed to insert characters only until the field is full. Systems which allow you to 'drop' characters off the right-hand end of a field by pressing the insert key are making it too easy to make mistakes.

Similarly, if you use the Commodore system where the DELETE key deletes the character *before* the cursor, rather than the character under the cursor (which is more natural), then obviously the operation should get beeped if he or she presses DELETE when the cursor is in the first position of the field.

Note that pressing INSERT should insert a space into the field, but pressing DELETE should cause a hyphen (or whatever) to appear at the end of the field so that you can still see how many more characters could fit in.

- *Clear Field:* the CLR key is ideal for this function, clearing the whole field from the current cursor position to the end of the field is invaluable when the user is replacing a long entry with a short one, because it saves having to key lots of spaces to wipe out the end of the old data.
- *Home Cursor:* this key takes you back to the start of the field, and we can use the HOME key for this purpose.
- *RETURN:* carries out exactly the same function as the 'Next Field' key. And of course it is the one which is usually used because it's easier to press.
- *ESCAPE:* as many Commodore machines such as the Vic or 64 do not have a specialist ESCAPE key, we have to make do with the Commodore key or RUN/STOP. The purpose of the ESCAPE key is to leave data entry immediately, without changing any data: it's a panic button for when you suddenly find that you've been amending the wrong record (in spite of all the help we have given by displaying the data on the screen). Rather than forcing the user to correct all the fields that have been changed, we let the user press ESCAPE: that takes the cursor back to the ACCOUNT NUMBER field leaving the record originally selected intact.

Housekeeping

Whenever the cursor leaves a field, the field should be automatically tidied up. Alphanumeric fields should be left-justified and any remaining hyphens changed to spaces. Numeric fields should be rounded to the correct number of decimal places and right-justified. If a field contains a money value, for instance, it should always be shown with two decimal places; so if the operator enters "15" the program should change it to "15.00" when the field is quitted.

Often there are limits on the values which can be entered into numeric fields. These may be *absolute* (the value must lie between 0 and 499) or *relative* (field 4 must be greater than field 3).

Absolute range checks should always be carried out when a field is quitted, because we can say categorically that if the value lies outside the range it is wrong.

With relative checks, though, matters are not so simple. If the operator tries to quit field 4 when it is in fact less than field 3, the problem could be either that field 4 is too big or that field 3 is too small. The best way to solve the problem is to do the range check after the second field (or after the last one, if there are more than two): and to do the checking *only* if the operator tries to move **down.** If he or she tries to move up, the range check shouldn't be carried out: the user could be going back up the screen to change field 3.

It is definitely wrong, however, to leave the check until all the fields have been entered: *carry out all validation as soon as possible!* And if a range error is found, the computer should give a full description of the problem – not just a vague message like "ILLEGAL VALUE". Something like this perhaps:

CREDIT LIMIT MUST LIE IN THE RANGE 100.00 TO 999.99

FINAL VOLUME MUST BE LESS THAN INITIAL VOLUME

When the program finds an error in a field and warns the operator with a beep, don't blank off the data in the field. The operator should be allowed to inspect the data to see where the mistake was made; and if there was only one character wrong; we don't want him or her to have to re-enter the whole field (in which case he would probably make another mistake).

When all the data has been entered, the program should ask the operator . . .

IS THE DATA CORRECT? PRESS (Y), (N) OR (ESCAPE)

(N) takes the cursor back to the first field on the screen; (Y) means that he or she is happy with the data, and the record can now be written back to disk or tape. (ESCAPE) means that the user has decided not to alter this record after all, and puts the cursor back on the ACCOUNTS NUMBER field.

Well, you were warned that there was more to data entry than a few INPUT statements! There is no denying that writing a subroutine to handle all that is a lot of work. And what's more, it really needs to be written in assembler rather than in Basic: otherwise even the slowest of one-fingered typists will be beating the program to the draw.

But don't forget that the subroutine only has to be written once, whereas the user probably has to use the program day after day for years on end.

To sum up then, we are trying to make the operator's job as easy as possible by:

1. ***Giving as many editing keys as possible.* You can even add some more if you want such as "RESTORE THE CHARACTER JUST DELETED", or "MOVE TO END OF FIELD".**
2. ***Carrying our range checks as soon as possible, but still giving the chance to correct mistakes easily.* Don't let your relative checks force the user to change the second field of a pair if it is really the first one which is faulty.**
3. ***Supplying the user with suggested values or defaults* which can be accepted by pressing (RETURN).**
4. ***Making the operation of the program as natural and as consistent as possible.* Try not to make the (SPACE) bar do one thing in part of the program and something else in another part.**

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The graphics are so stunning they would not be out of place on a Christmas card.

The object of the game is to attempt to stop an industrial dispute that is threatening the delivery of toys to children of the world.

It's Christmas Eve and not a child anywhere can get to sleep with thoughts of the coming day.

But unknown to them there is a problem at the North Pole which only you can sort out. You must solve the problems and get Santa's sleigh loaded. When all the toys are on board the reindeer take the strain and Santa takes off on his annual delivery round.

All you have to do to get your hands on *Merry Christmas* from Melbourne House is fill in the form below and send it off to us without delay. Your completed form together with a cheque or postal order for 95 pence must reach us before December 17th. Do not send cash through the post.

To get your copy of Merry Christmas from Melbourne House cut out the form and send it off without delay including 95 pence in cheque or PO.
Cut out the cassette inlay and mount on a piece of card. Keep in a safe place until your game arrives.

To Load
Type Load
Press Enter
Press Play on tape recorder
Merry Christmas will load automatically
Happy adventuring

MERRY CHRISTMAS



Merry Christmas from Melbourne House

Merry Christmas from Melbourne House is an animated adventure game.

It's your job to see that Santa leaves the North Pole in time to deliver the toys to the children of the world.

Features include:

- Animated graphics locations
- Father Christmas and his reindeer
- Pavloada
- Easy-enter commands
- Drifting snow
- Elves

This game will delight all the family at Christmas. From the leading adventure games company who brought you *The Hobbit*, *Sherlock* and *Zim Sala Bim*.



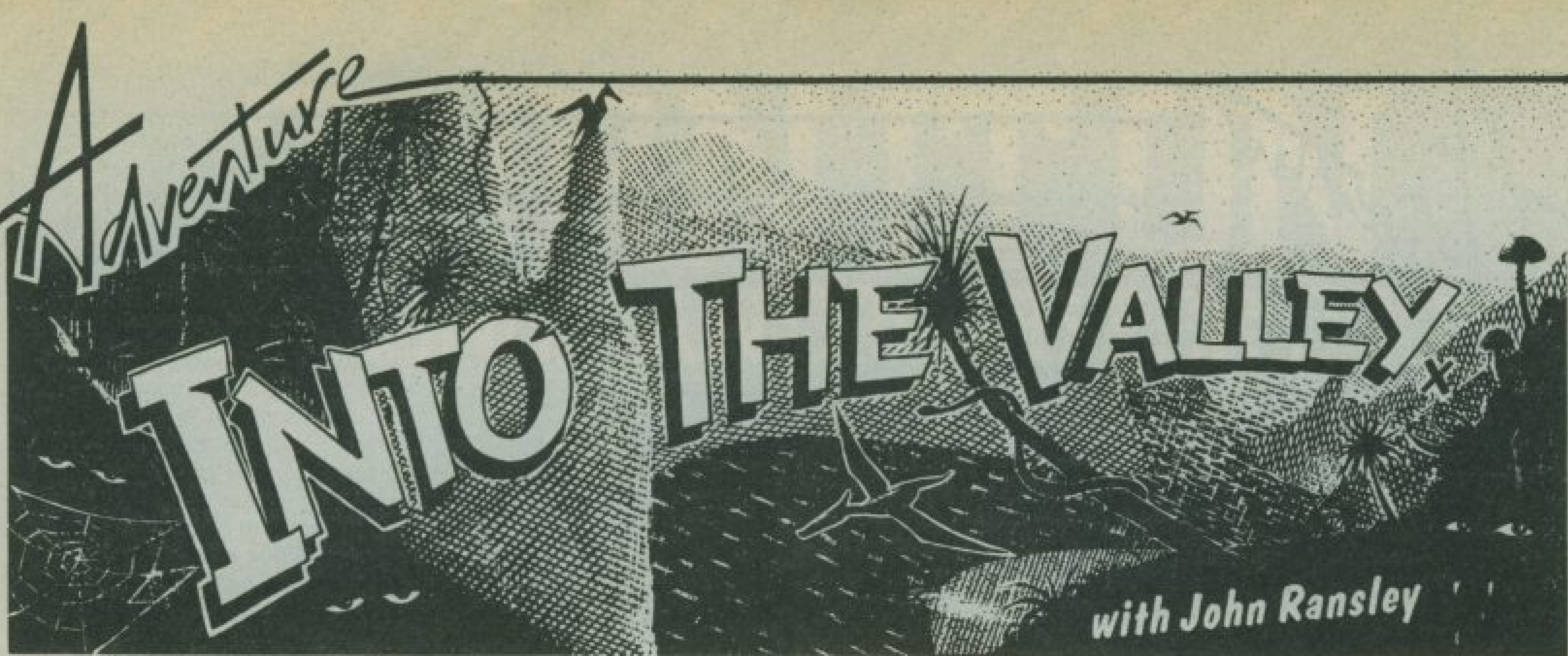
Please rush me a copy of *Merry Christmas* from Melbourne House. I understand that this offer is made exclusively to readers of Commodore User. I enclose cheque/postal order to the value of 95 pence.

NAME ....

ADDRESS ....

....

.... SIGNED ....



Into the Valley

with John Ransley

The great Christmas Rush is well and truly rolling. Software houses are falling over themselves to release their wares in time to cajole your festive spirit. Whether you're an Adventure purist or the occasional joystick grappler, the choice is so wide that you're sure to be tempted to take the can opener to your money box. Here's a look at some of the best software on offer...

A new title from Level 9 is always reckoned to be an Event, and Pete Austin groupies won't find anything to disappoint them in **Return to Eden** – which also marks Level 9's first graphic offering. I'm still not sure whether pictures actually improve my enjoyment of an adventure – but this title's visual appeal makes a convincing case for them. Return to Eden features nearly 250 locations (I'm told!) and those I did manage to explore were interestingly and quickly drawn.

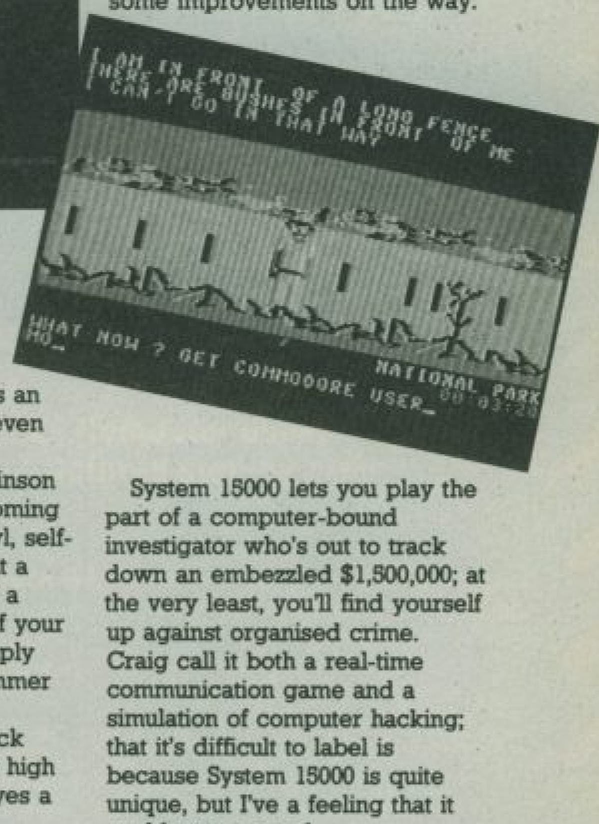
The storyline features unisexual hero Kim Kimberley who, fresh from scoring 110% in Snowball, finds him/herself trying to beat a phony murder rap in downtown robotsville – and judging by what happened to me after my first wrong move, it sure is no place to take Strawberry Shortcake.

You'll encounter stacks of original, absorbing puzzles begging for logical and/or inspired solutions, but the truly confounded (or just simple cheats like me) can write to Level 9 for a free sanity-saving clue sheet. Hock your lazerlance and buy a copy at £9.90.

The same Level 9 team are behind **The Saga of Erik the Viking** – this time on the Mosaic label – which takes its title and inspiration from Terry Jones' children's story – but don't get the impression that it's pitched only towards the younger player. Some 200 graphic locations await your attention, and very clear playing instructions and helpful extracts from the book will soon get you on your way. Incidentally, the overall packaging and presentation of this as of Mosaic's other titles sets an excellent example; the substantial library case even includes a spare parking space for the blank cassette you'll use to store any SAVEd versions of the game.

The two other new titles from Mosaic are **The Stainless Steel Rat Saves the World**, based on Harry Harrison's classic time-juggling novel of the early 70s (you even get a free copy of the paperback as a source of some clues), and **The Nomad of Time**, developed from the Oswald Bastable stories of Michael Moorcock. They're both illustrated text adventures coded by Shards (of Pettigrew Chronicles fame), which ensures an above-average quality of program. All three titles are fastload and cost £9.95 each.





Above: Zim Sala Bim – the first Commodore adventure combining joystick control with test-entry
Right: African Safari – Zim Sala Bim in the jungle

Raster Tip

Is your enjoyment of graphic adventures spoilt by the dreaded raster rogue; that distracting shimmering along the bottom edge of the hi-res picture where it meets the rest of the screen? It's sometimes possible to iron out this quirk in your own programs, but it remains as an all-too-evident freature of even many top titles.

Here's a very Heath Robinson but effective way of overcoming it. From a roll of black vinyl, self-adhesive insulation tape cut a strip about 1/4 wide and of a length equal to the width of your TV screen — and then simply stick it down over the 'shimmer line'. You can use instead masking tape coloured black with a felt pen. Not exactly high tech but it will give your eyes a break.

Sleuthing with System 15000

Sometimes it's just impossible to pigeon-hole a program; is **System 15000** an adventure, a strategy game, or a simulation? Actually, it's none of these and all of them. And if you think that's confusing, you should hear about its history. System 15000 was first marketed under the Ferranti & Craig banner, but changes there meant that it never really got off the ground. But now, David Giles and Richard Craig have relaunched System 15000 through Craig Communications (look for the "2nd Edition" flash on the packaging), and have made some improvements on the way.

System 15000 lets you play the part of a computer-bound investigator who's out to track down an embezzled $1,500,000; at the very least, you'll find yourself up against organised crime. Craig call it both a real-time communication game and a simulation of computer hacking; that it's difficult to label is because System 15000 is quite unique, but I've a feeling that it could start a trend.

My initial attempts have thrown up some crisp and unusual screen responses with excellent sound effects (a rarity in 64 adventures, despite its unsurpassed potential to produce them). So far, I've not sniffed out so much as a forged luncheon voucher, and I suspect that System 15000 will keep me guessing and entertained long

after my interest in some more conventional adventures has withered.

Not that you'd think so to look at its packaging, because System 15000 doesn't do itself any favours when it comes to counter appeal. A game that's so different and hard to describe needs to sound all the bells and whistles it can; the existing dull and uninspiring presentation desperately needs rethinking if System 15000 is to get the attention it no doubt merits. Price is £12.95 on fastload cassette for the 64.

Turkish Delight?

You've got to hand it to Melbourne House for offering the broadest choice of adventures – ranging from the very playable **Classic Adventure** (fastload, £6.95) – their full text implementation of the one that started it all – to the visually entertaining but not so undemanding **Zim Sala Bim** (fastload, £9.95). This animated romp through the land of 1001 OPEC members on a bid to defeat the murderous Sultan really is a lot of fun, and pulls off some nice tricks with 3D scrolling, although my copy exhibited a tendency for the text colouring to degrade when I entered a wrong response. Clear and complete instructions. Not exactly my goblet of goat's milk but the youngsters will love it.

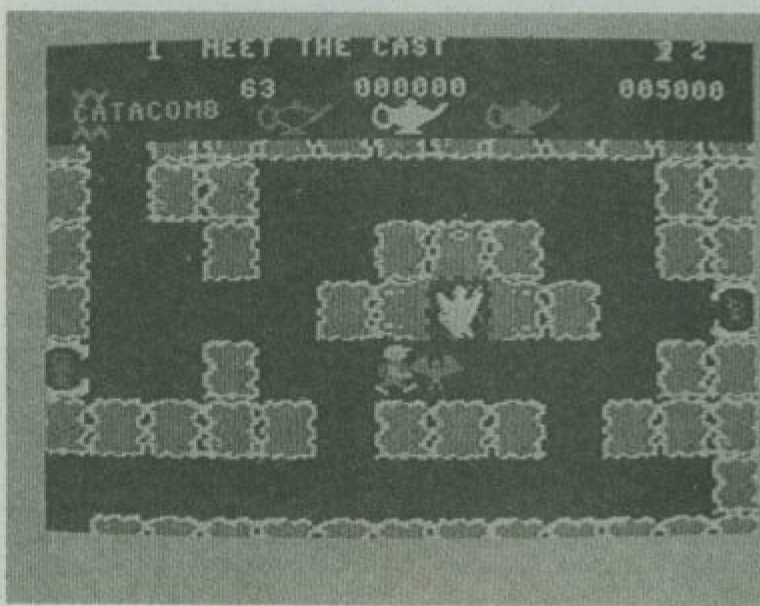
They're also sure to love **Cuthbert Enters The Tombs of Doom** from Microdeal. In fact, everyone will. This is what I call a proper arcade adventure; the fastload tape comes in a decent case complete with a colourful booklet full of hints and maps and an enigmatic key.

Cuthbert himself is a cute animated sprite, whom you must guide through the mysteries of more than 200 hi-res locations, avoiding assorted ghouls, fiends, homicidal bats, and other minority groups of the kind you'd expect to encounter only in the lobby of the GLC. Simple? Try it – you'll need plenty of strategy and fast thinking. Definitely a superior piece of merchandise, my son – and at a touch under £7, what can I say. Triffic.

Casting a Spell

Sorcery from Virgin (fastload, £7.95) comes a close second; a race against time, played out on 17 highly-detailed and colourful screens, to save Stonehenge from the evil Necromancer and his sulphurous cronies. Forget what you've heard about earlier Virgin software (I'm sure they'd like you to); this is good stuff. Initial impressions of **Booty**, a rollicking arcade adventure with scores of novel screens and as many treasures to find, are also very favourable. It's among the first 64 titles on the new Firebird label from British Telecom. Ever so cheap at £2.50 and not at all nasty. Braingames follow up their first graphic strategy game for the C64, Fame Quest, with **Flame Island** and **Castle Fear** (£8.95, disk £12.95). More about these another time.

In the realm of full-blooded arcade action behind the thinnest of adventure veils, ask your micro emporium to run the demo mode of **Storm Warrior** from Frontrunner (£7.95, disk £9.95), which will give you some idea of the action this packs into five levels of play across 12 screens; it's different and the thunder and lightning are so realistic, they ought to provide a free cover for the budgie cage.



Cuthbert Enters The Tombs of Doom – great fun but is it adventure?

Rest of the Best

Other new titles expected to hit the streets by Christmas include **African Safari** from Interdisc (£9.95), another state of the art animated text adventure by the author of Zim Sala Bim; a conventional and top pedigree (Jamie Thomson et al) text adventure, **Tower of Despair**, from Games Workshop; a two-part graphic challenge, **Se-Kaa of Assiah**, from Mastervision (£7.50), as well as 64 versions of The Wrath of Magra, Black Crystal and Volcanic Dungeon – the creations of the much-lamented Carnell, now under Mastervision's wing; **Swords of Sorcery**, an ambitious animated quest from PSS at £9.95 which you can expand later by adding extra modules; **The Secret River** and **The Wizard's Citadel** at £6.95 each from newcomers Triffid Software; an under-wraps title from Virgin based on *The Eagle's* famous Dan Dare strip.

Zim Sala Bim to win

Flicking a duster round the old catacombs recently revealed a mint library copy of Zim Sala Bim and Classic Adventure going spare; they're up for grabs if you can solve this: What is it that God never sees, Kings and Queens rarely see, but we see every day? Write your answer on a postcard together with your name and address, and mail it to Adventure Quiz, Commodore User, 30-32 Farringdon Lane, London EC1R 3RU to arrive by 24th December. First correct solution picked from the pile wins the brace.

Book look

Finally, if your spouse/companion/kids/rental company insist on reclaiming the TV this holiday, you can still avoid the season of goodwill by burying your mind in a good read. For the sheer joy of mopping up the product of a really imaginative mind, you couldn't do better than dig into Bruce Galloway's definitive guide **Fantasy Wargaming** (Patrick Stephens/Thorsen Publishing, 222pp, £7.95). The first pleasant surprise is that you're actually getting a hardback at that price. The second is that treasure trove of information it contains about creating scenarios and characters, playing rules, combat, magic and spells and almost every other element of the dungeonmaster's art.

Bruce Galloway's thoroughness is exemplary, and the 60 introductory pages describing medieval society, myths, legend and religion alone are enough to trigger 101 ideas for your own adventures. And that's the strength of this book. It must be almost indispensable if you're a legitimate Dungeons and Dragons player, but if you have half a mind to start writing your own board or computer-based fantasy games, there's absolutely loads in it to help you. I can't believe that anyone will ever produce a better book of this kind; specially good value.

You won't need to cash up quite so many book tokens for your copy of David Estall's paperback **Adventures For Your Commodore 64** (Virgin, 128pp, £2.95), and it'll give you plenty of hours at the keyboard once you get the TV back. Here you'll find listings for six complete games, including Schools Out and Hunt the Wumpus for the younger player, to Pearl Diver (with sprites and sound) and The Guardians of Arimathea – a pretty meaty text adventure that's not half bad. The structure of the individual programs isn't described, but they're obviously open to your own study, and the author adds a useful half-dozen pages on adventure writing for the novice. Altogether an excellent buy for the beginner player/author – and for the more experienced gamer who wants something a little less demanding to go with the white burgundy.

DON'T forget that there's a freshly-minted copy of A J Bradbury's book Adventure Games for the Commodore 64 (very favourably reviewed last month) for the neatest tip/mini routine for enhancing adventure text screen display or presentation. Why not drop me a line with your idea now? We'll publish the best two. Meanwhile, here's wishing you all an Adventurous Christmas. ●



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TALK TO ME LIKE 64s DO

Speech synthesisers for the Commodore 64

*In the never ending quest to let you do more with your computer than just play games, speech synthesisers look like being an attractive (yet expensive) proposition. Just imagine it, your beloved Commodore 64 being able to talk to you. At least two speech synthesiser packages are now available for the 64. Kevin Bergin has conversed with **Speakezy** from **JCB Micros** and **Currah's** new **Speech 64** package, and asks himself whether all this talk isn't just a lot of hot air.*

by Kevin Bergin

Getting your home computer to talk to you is not real news. A number of synthesisers have been around for quite a while: like Adman's package for the Vic, JCB's for the Dragon and Currah's for the Spectrum. The latter two have now adapted those earlier versions for the Commodore 64. Bringing up the rear is Commodore with its very own Magic Voice speech module. Available (hopefully) by Christmas, it works on a different principle to the above, but is worth including for the sake of completeness. But let's get going with the newest offering, Speech 64 from Currah Computors.

Speech 64

Speech 64 is a cartridge that not surprisingly plugs into the cartridge port of the 64. It has a DIN plug that goes into the 64's audio/video socket. This will cause problems for people using that port to drive a monitor. Although nothing is mentioned in the instructions, Currah will supply you with a video cable splitter (around £2) to let you correct both devices simultaneously. The audio socket lead is very short, making it difficult to have the sound go through an amplifier.

Anyway once the cartridge is correctly inserted and the 64 is switched on, the device is initialised with the simple command: **INIT**<press return>.

From here on the 64 will voice any key you press (providing the volume is turned up). This can be somewhat annoying if you are writing programs. No need to worry, the cartridge can be turned off with the **KOFF**, and on again with the **KON** commands. You also have the choice of two voices: low or high, each offered with or without inflection. This does give a wide range of different sounds.

Programs that talk

Presuming you wish to hear your 64 chattering away there is a wide range of choices when *'speaking'* from a program. Currah have used the by now familiar **SAY** command. With this, the user may simply type in a word between quotes, for example; **SAY "WELCOME"** and the synthesiser will try to say *'welcome'*, but like many words it will need to spell it as it sounds; **SAY "WELKUM"**.

A few words of explanation here. Speech 64's software works by scanning the text you've inputted and then converting it automatically into the speech sounds required. The manual calls it the 'speech to text converter'. It does this by putting together a set of allophones (the component sounds that make up a word) from its stock. Although it uses a set of pronunciation rules, it can't cover every eventuality - like some of the baffling spellings you find in the English language.

So you're provided with a fairly impressive look-up table for non-standard pronunciation. Therefore using the look-up table and



allophones, it is possible to create a likeness of most words and in any language (the review was conducted in poor English). Delays can be produced by using standard punctuation and the cartridge will give friendly error messages if you are using it from Basic.

All of the aforementioned methods can be combined. For example, speech may be produced using the **SAY** command with text, and allophones inside square brackets. Typing in text in upper case gives a higher intonation, whilst lower case gives a much deeper voice. That's pretty useful because you can approximate human speed patterns rather than being stuck with a droning monotonous voice. But you can't use it in Text to Speech mode.

Currah claims that Speech 64 does not slow down the 64 as the cartridge uses a buffer, which allows speech and other operations such as graphics to be produced at the same time. The problem is that any speech will take a lot longer to finish than most other operations (animation for example), this means that the overall effect is a lot slower.

Documentation

Almost non-existent is probably the best way to describe the manual. It comprises sixteen (very small) pages of information on Speech 64. The first two pages deal with installing and initialising the cartridge; a couple of examples are given in the form of direct mode statements to turn the cartridge on and off in both voices. The next two pages take you briefly through the **SAY** command with text and allophones. Another two pages are given over to allophones, with a couple of words on error messages. There is a page on different voices and one on the speech buffer.

So far, this is all very elementary stuff on using Speech 64 from Basic. The next four pages are on using the device with machine code. Is this any better? No, afraid not. Currah start this section by implying you will have a long slog using machine code with Speech 64 — not very inspiring. However, the manual does go on to give you four small examples with brief explanations. The program to initialise the device from machine-code is given, and an example program that uses the 256 allophone speech buffer. There's also a brief explanation of how to get at the speech chip directly, without using the aforementioned **INIT** routine.

There is one page containing the decimal and hex codes for the allophones. That's useful because when you're using machine code, you will need to convert the allophones your're working with into hex.

A speaking clock program is also listed on the penultimate page. The last page gives a list of the commands added to Basic when Speech 64 is initialised, which includes the first and only mention of the **BYE** command. This turns Speech 64 off until an **INIT** command is issued.

Using Speech 64

So what can you do with Speech 64? You can, of course, include it in your own programs and perhaps software houses will use it in games and educational products. Currah gave a list of five software houses that were producing games using the device. In fact only few checked out, the rest either said nothing or said they hadn't decided whether to use it or not. **Gremlin** have included speech in *Suicide Express* and **Taskset** in its *Cadcam Warrior*. But, at present, there seem to be no other takers.

For £29.95 it seems that you get a fairly powerful if a little poorly documented speech synthesiser. How much one likes or dislikes it must be a matter of opinion. It seemed very slow and clumsy to use, as well as being a rather tinny re-production of the real thing — certainly not up to the best arcade standards.

The last comment must be that any speech synthesiser should have extensive software back-up if it is to be more than a novelty, and there seems to be no substantial software in the making for Speech 64. As a footnote to this review Currah have just informed me that a number of software houses are showing interest in Speech 64 and a statement is to be issued by Currah in the near future.

Speakezy

Like Speech 64, Speakezy is a cartridge that plugs into the cartridge port on the 64. And it works in more or less the same way by using a standard set of allophones. It also has a DIN plug that fits into the 64's audio/video port. Once again JCB is offering a splitter lead to enable you to use a monitor. When the 64 is switched on Speakezy is initialised immediately.

Speakezy adds four commands to Basic, they are **SAY, SPEAK, ADD** and **WAIT ON**. The device and its commands are very easy to use. The **SAY** command is used with one of 72 pre-defined words, so you have a fixed library to work with. The library includes any number that the 64 can generate. Speakezy will also **SAY** numeric strings and variables. This means that the 64 could generate speech relating to locations using PEEK to return the value.

Unlike Speech 64, Speakezy needs to be told when to turn its voice off, each word needs a

continued on page 61

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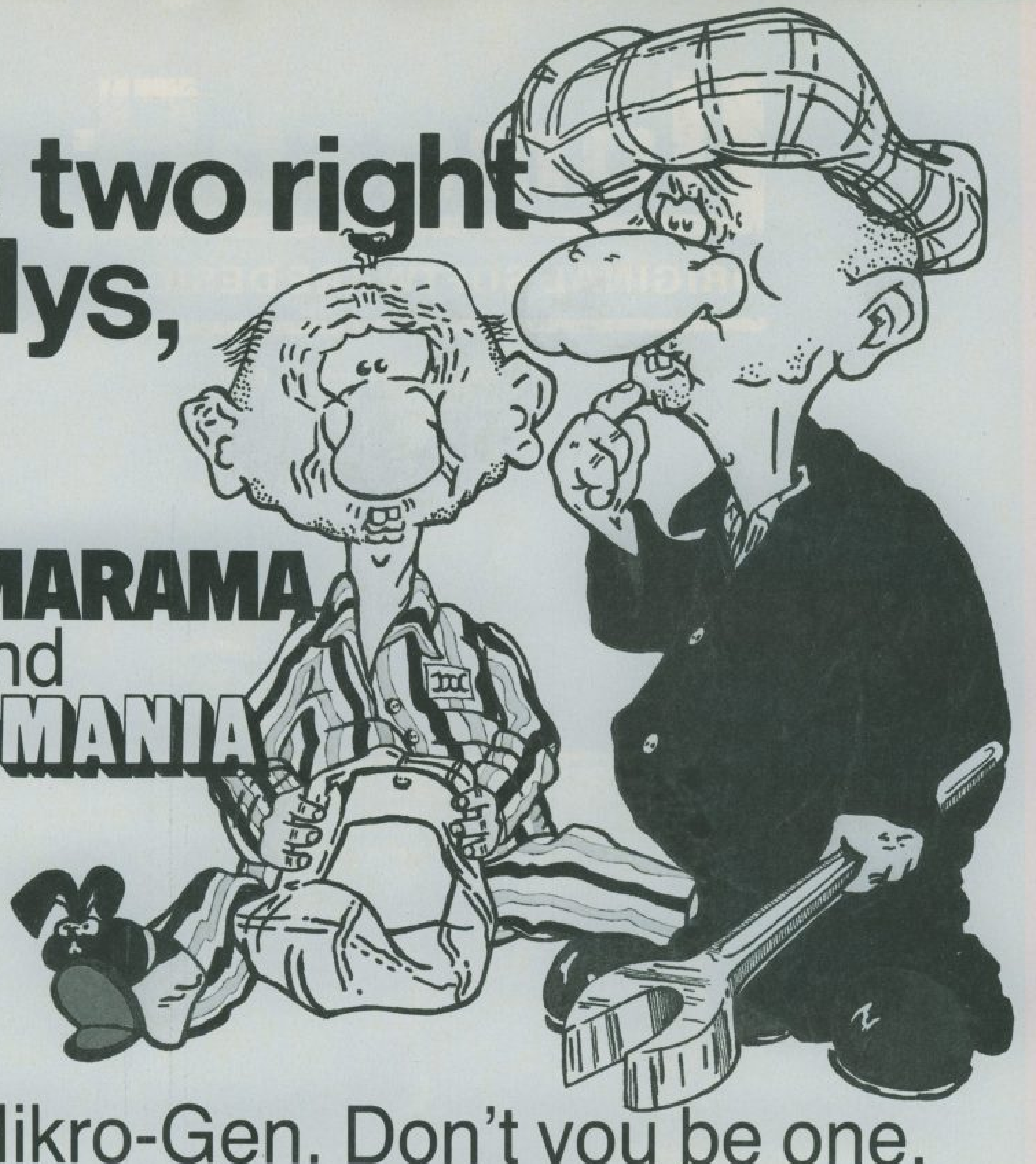
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SOLID GOLD

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Use of colour: very good
Graphics: superb with excellent animation
Sound: great tune (continuous) with well used sound effects – sound may be switched off
Skill levels: one
Lives: three

● 'Automania has some of the best animation and realistic graphics that I have ever seen. All the graphics are large and colourful, and, needless to say, they move smoothly ... The best game that Mikro-Gen have ever produced and worth buying.'

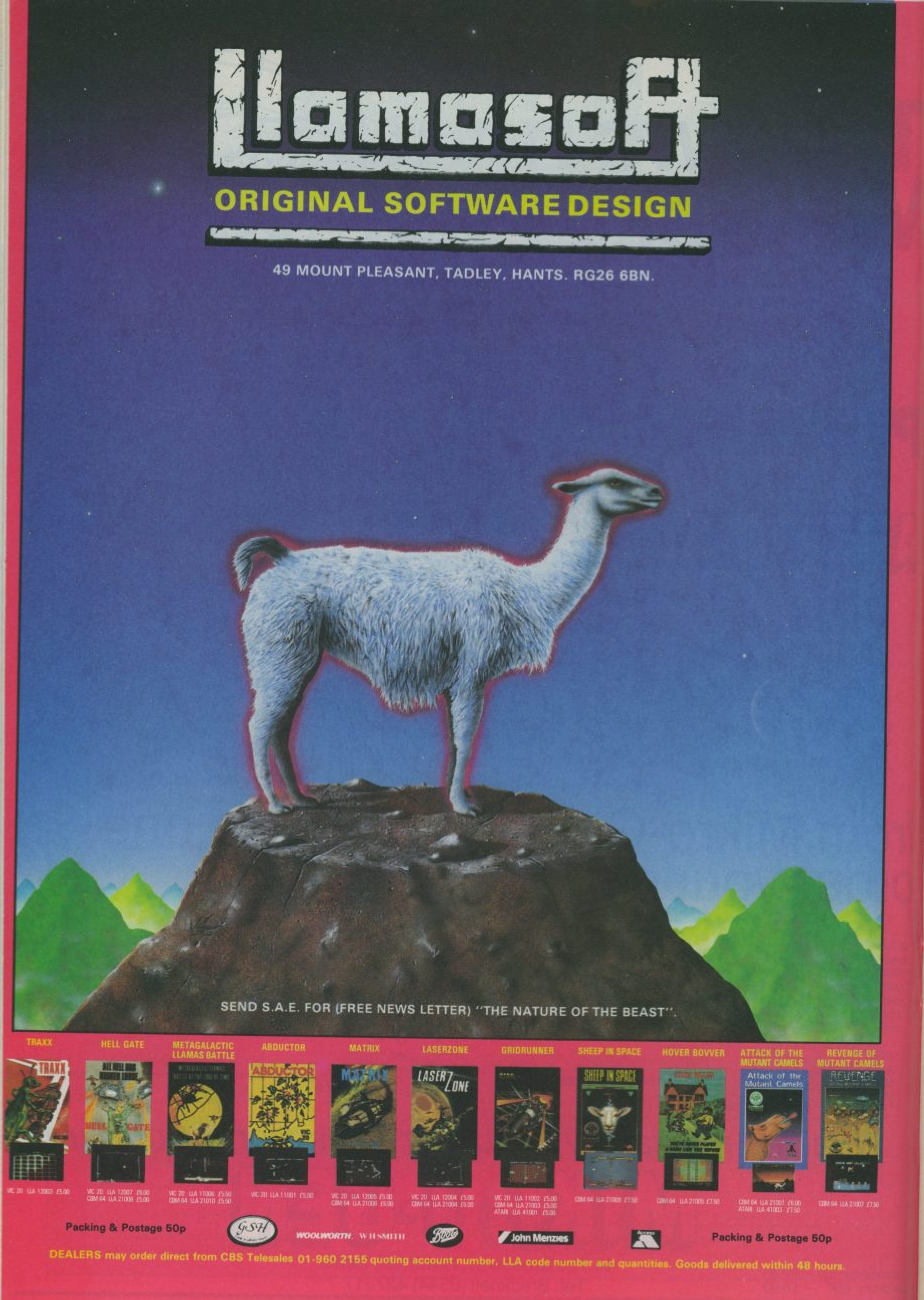
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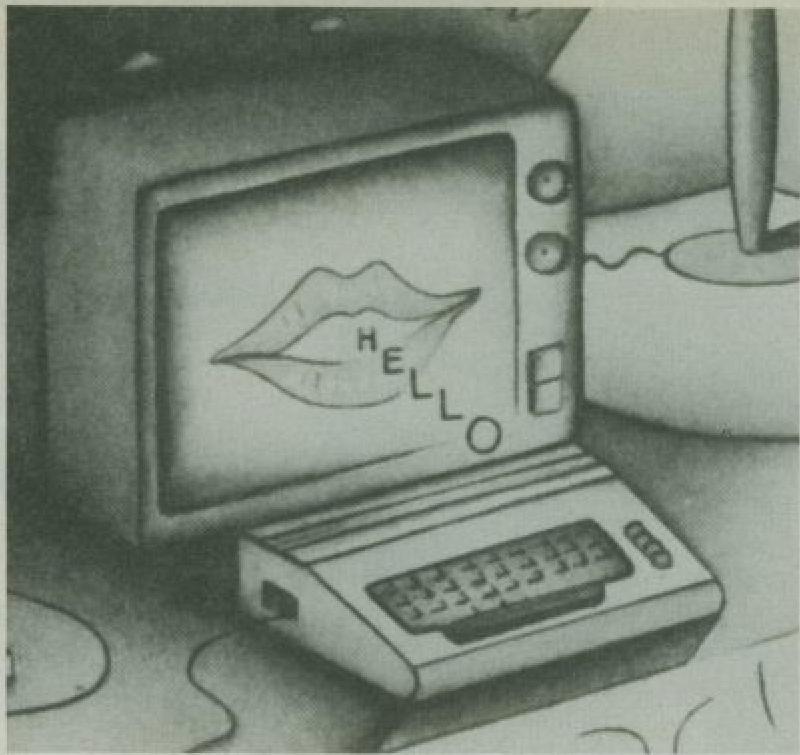
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continued from page 57

numeric delimiter between 0-5 separated by a comma. Speakezy also uses allophones with the command **SPEAK**. The format for this command is the same as **SAY** except the words must be spelled as they sound, each allophone must be spelt correctly and separated with commas. The manual also points out that the **SAY** command is compatible with all Basic string-handling commands on the 64. So you can define phrases as string variables and add them together, even slice and concatenate them within a Basic program.

But there is also an **ADD** command which is used to join words together that are constructed with both the **SAY** and **SPEAK** commands. The last command is **WAIT ON**, although this is not a new command its use with Speakezy is unique. The command **WAIT ON** can be used to halt the processor if Speakezy is still talking, this allows the user to check that words are not overlaid.

Documentation

The Speakezy manual is a good introduction and guide to Speakezy's facilities. Each of the commands gets its own section with the addition of at least one demo program. And all possible error messages are covered. Like Speech 64, there is a limited amount of technical information and advice if using machine code, but JCB does offer assistance to anyone wishing to write or telephone. Finally there's an alphabetic list of the pre-defined words and a list of allophones with some helpful notes followed by an allophone address table.

Conclusions

Much the same things must be said here as for Speech 64 but with more praise for the good documentation and ease of use. On the other hand there seems to be no software at all available for Speakezy, so you will have to amuse yourselves with the device alone. At £29.95 (same as Speech 64) it is perhaps worth experimenting with, but how long will it be before commercial software uses in-built speech synthesis or before the user discards the speech unit because there's really not much scope for really productive use.

Not true, there may be many useful and practical applications, especially for the blind and impaired of speech. At present, though, speech synthesisers seem to be just for fun.

Magic Voice

Unfortunately, Commodore's Magic Voice cartridge couldn't be put through its paces here because, despite the length of time it's been talked about, the product is not yet available in Britain. So a few preliminary details must suffice.

Magic Voice works differently to both Speech 64 and Speakezy in that it doesn't use allophones to build words, but a system of digitised speech – so you don't get an infinite vocabulary. In fact, the device is pre-programmed with a set of 235 'utterances'.

But it does sound much more realistic than the two aforementioned packages because the words are actually digital recordings of a human voice. You have a choice of male, female or child voices and control over the pace of speech.

Despite the superior speech quality, its limited speaking range presents a few problems. A Commodore spokesman did tell us that the device will allow you to define your own library of words but couldn't describe exactly how that was done. Apart from that, there will be a range of disks (probably not cassettes) that give you extra vocabulary.

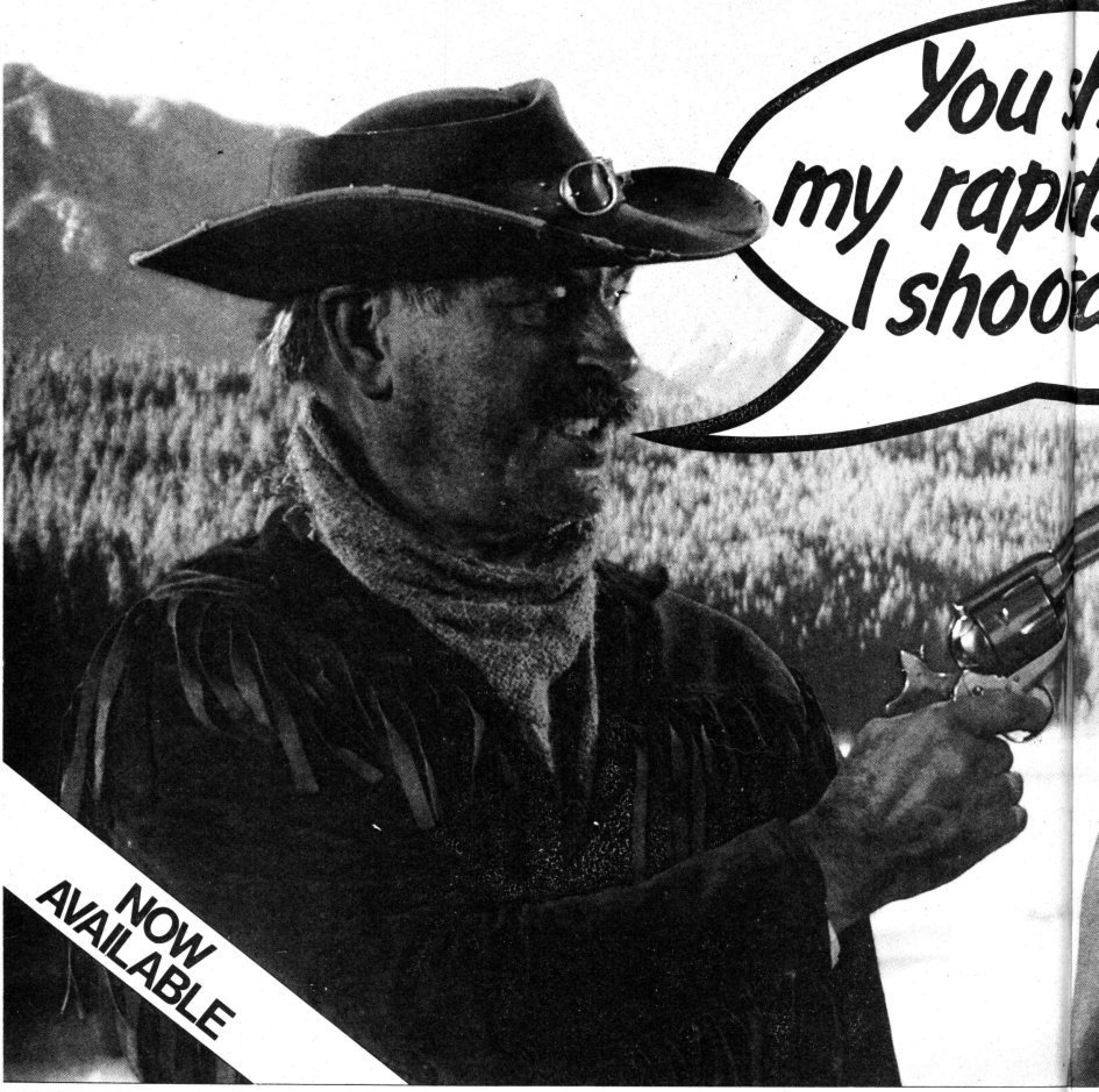
Using Magic Voice

The cartridge should be in the shops in time for Christmas and its major selling point will be as a complement to Commodore's educational software. The B J Bear learning series, for example, uses Magic Voice as an optional enhancement. Other packages like Magic Garden and Magic Toolbox really need Magic Voice, and they won't be available until the cartridge itself appears. Two arcade games for the 64, Gorf and Wizard of Wor, also use it.

So it looks as though Magic Voice will be supported by software. But, at an estimated £49.95, its real value will take a lot of convincing.

Under review	Speech 64
Description:	speech synthesiser cartridge for the Commodore 64
Supplier:	Currah Computor Components Ltd
Address:	Hollymount, Wooler Road, Hartlepool, Cleveland TS26 0AH
Telephone:	0632-323535
Summary:	meagre documentation and lack of software support make this technically classy product somewhat less than exciting or useful.
Price:	£29.95

Under review	Speakezy
Description:	speech synthesiser cartridge for the Commodore 64
Supplier:	J.C.B. (microsystems)
Address:	29 Southbourne Road, Bournemouth, Dorset BH6 5AE
Telephone:	0202-423973
Summary:	no software back-up but better documentation. Like Speech 64, an expensive toy.
Price:	£29.95



CLIFF HANGER

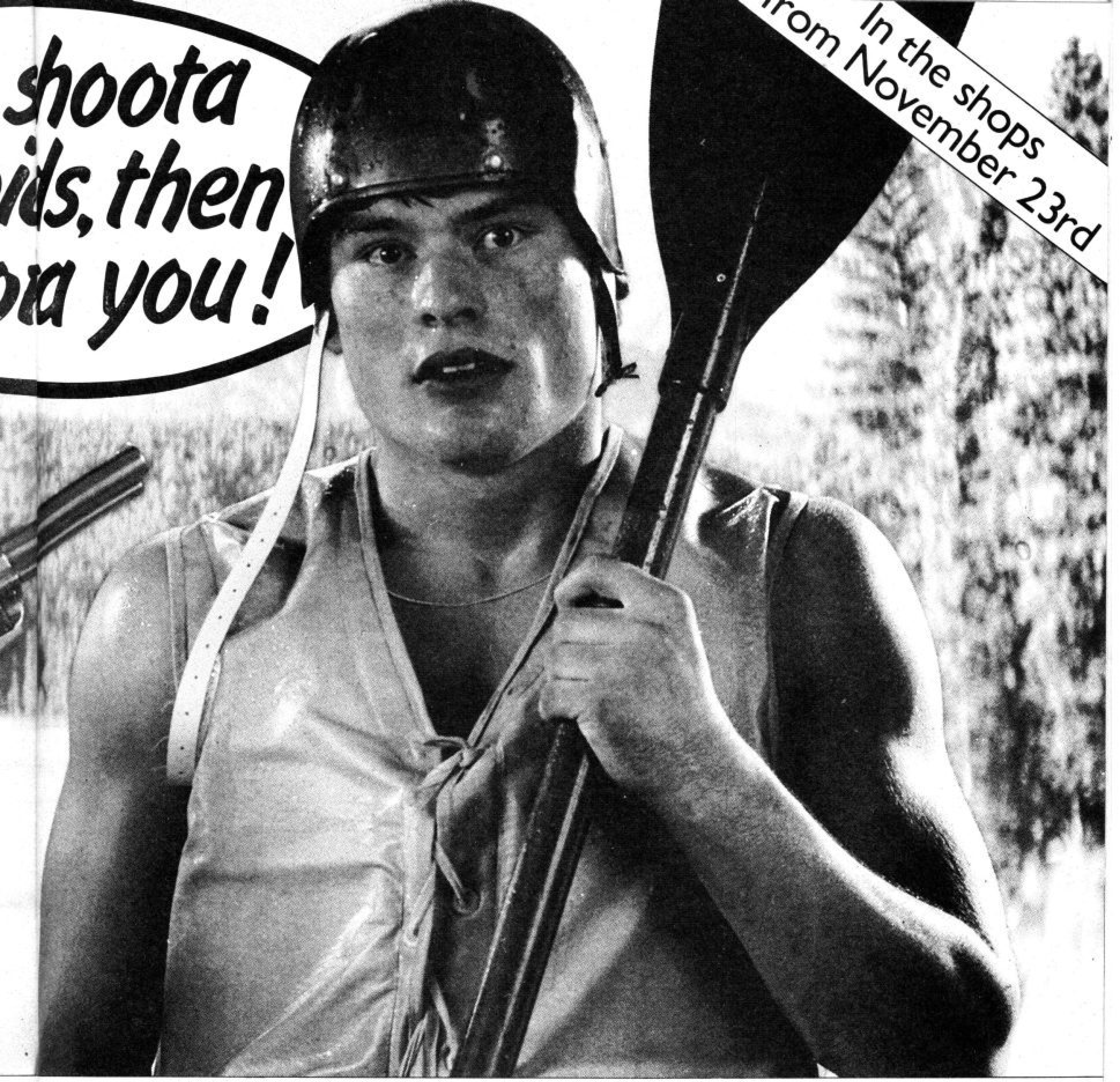
AUTHOR – JAMES DAY   ORIGINAL MUSIC – BRIAN DOE

Thrill to the cartoon style action of Cliff Hanger, a really original, Wild West game. As Cliff the hero, you've got to stop the bandito shooting up the canyon. But with its own brand of wacky cartoon action fun, things simply aren't as they seem in Cliff Hanger. For a start, the boulder you throw at the ol' bandito may just come bouncing back at you.

Cliff Hanger incorporates all the elements that have made New Generation games best sellers for the Spectrum, such as original ideas, superb graphics and hilarious happenings – but now it's available first for the Commodore 64.

Featuring 50 separate screens, three levels of difficulty, one or two players scoring, Hall of fame and joystick compatibility or user defined keys, Cliff Hanger is set to be **THE** Commodore games playing sensation. Available from any good software store for just **£7.95.**

Selected titles of New Generation Software are available from your local computer store and larger branches of: John Menzies WHSMITH Boots WOOLWORTH Spectrum



Shoot the Rapids

AUTHOR – PAUL BUNN

Ever wondered what it would be like to face the fierce white water in a top class canoeist slalom run? Well wonder no more because you can enjoy the fast action thrill of competitive canoeing from the comfort of your own armchair with Shoot the Rapids.

It's a game that involves real skill because you must move your joystick to simulate paddling action. You must get through the gates of the slalom course in the fastest time possible, while avoiding the river bank and rocks. There are also extra hazards like rogue speed boats and interfering beavers to worry about.

This multi level game features increasingly difficult river courses with superb graphics and smooth scrolling along the river. Qualifying times have to be reached to move onto the next course.

With Hall of Fame, one or two player scoring and joystick compatibility, Shoot the Rapids is probably the best sports action simulation game devised to date. Available from any good software store for just **£7.95.**

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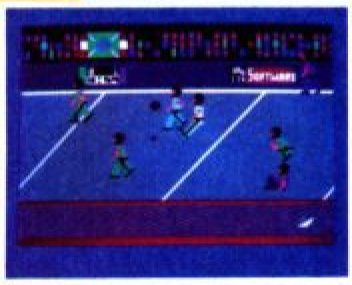
Games

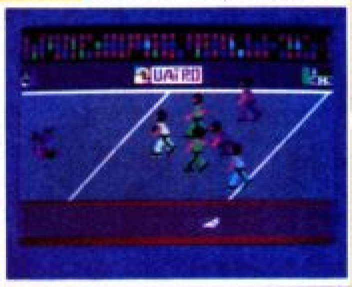
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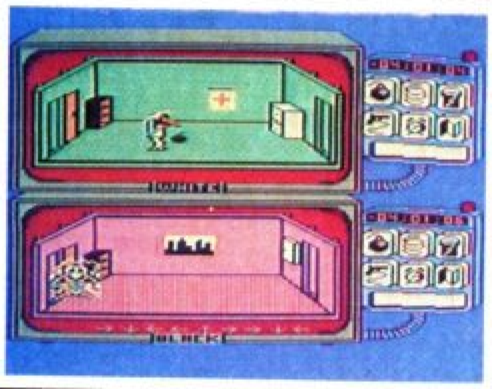
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SCREEN SCENE



Spy Vs Spy
Commodore 64
Beyond
Price £9.95

Presentation: ■■■■□
Skill level: ■■■■□
Interest: ■■■■□
Value for money: ■■■□□

Spy Vs Spy – the popular Mad Magazine cartoon strip is set to make its debut as a computer game in time for the Christmas rush.

The game is the work of First Star Software the company headed by top American games writer – Fernando Herera.

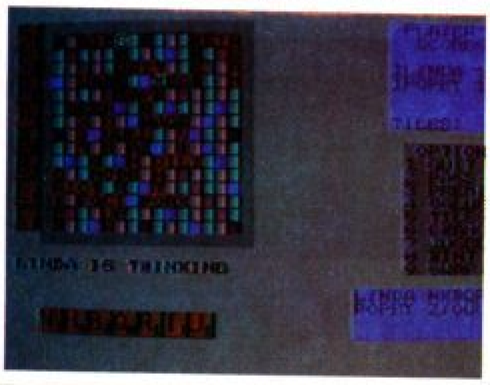
Spy is produced under license in the UK by Beyond Software of *Lords of Midnight* fame.

The game features a unique split-screen display which enables two players to play against each other simultaneously.

Alternatively you can choose to play against the computer.

There are two Spies – each searching for the hidden briefcase and only exit from the embassy. Before you make good your escape you also need to collect your passport, money, and key to get out of the building.

This would be a piece of cake were you the only intruder in the foreign embassy. What makes *Spy Vs Spy* different



Scrabble
Commodore 64
Leisure Genius
Price £12.95

Presentation: ■■■□□
Skill level: ■■■■□
Interest: ■■■■□
Value for money: ■■■□□

You would think that one of the advantages of a computerised game of Scrabble would be that it would enable you to get the game up and running pretty quickly, cutting out all that business of choosing a letter out of the bag, and using a matchstick for the missing Z.

Not so with the version just launched from Leisure Genius. This monster takes a good fifteen minutes to load. Take a slap on the wrists LG – most people would be half way through a conventional game using board and tiles before this tape loads. Isn't it about time that all 64 software turbo loads?

That said – the software is excellent, and provides something for that growing army of people who are sick of jumping from platform to platform, gobbling fruits, and shooting aliens.

Four different skill levels enable the player(s) to choose a game that will suit them based on their average performance at the board game, i.e. skill level one will suit players who average about the 300 points mark.



Cliff Hanger
Commodore 64
New Generation
Price £7.95

Presentation: ■■■□□
Skill level: ■■□□□
Interest: ■■□□□
Value for money: ■■□□□

Cliff Hanger is the first real attempt to turn a cartoon into a computer game maintaining the feel of animation.

The cartoon chosen is reminiscent of Road Runner and any second you are expecting your 64 to go Beep Beep.

The objective of the game is to kill the Bandito who is running up the valley taking pot shots at you.

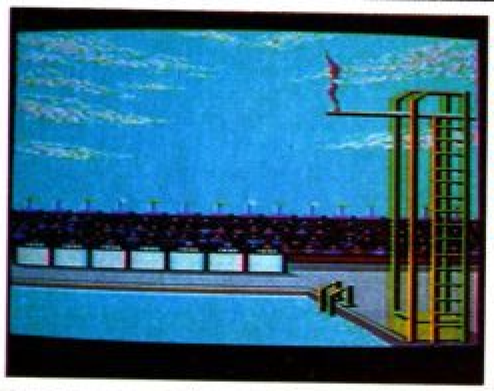
The screens are generated randomly and offer you a variety of ways of getting even with Bandito.

Most of these involve dropping some sort of heavy weight on him from your vantage point on the ridge above the valley road.

Other screens offer you boomerangs, cannons, see-saw boulder mechanisms, and even bombs to dislodge other boulders.

At first the game appears to be ridiculously simple until you realise after playing it for several hours that you haven't splattered the little B once.

It'll take quite a few goes to lob a boulder onto the Bandit's head but when



Summer Games
Commodore 64
Quicksilva
Price £9.95 cass disk £19.99

Presentation: ■■■■□
Skill level: ■■■■□
Interest: ■■■■□
Value for money: ■■■□□

The idea is either shake the joystick, or rapidly press the fire button to make your athletes move – the faster you shake or fire the faster your athlete moves.

The first game we tested was *Daley Thompson's Decathlon* from Ocean, which was the closest of the three games to the original *Track and Field*.

Two catroon-style athletes compete in a series of track and field events – including Pole Vault, 100 metres dash, hurdles, and discus.

One clever touch is that there are several advertising hoardings in the stadium with companies like W H Smiths, Boots, and Menzies. That must've sold a few, eh boys?

Next up was Activision's offering – *Decathlon*, an authentic ten-event challenge for up to four players.

This scored higher than Daley's game on graphics and it also benefitted from a larger screen presentation of the track and athletes.

The Activision game also had better



Ghostbusters
Commodore 64
Activision
Price £10.99 cass £19.99 disk

Presentation: ■■■■■
Skill level: ■■■■□
Interest: ■■■■■
Value for money: ■■■■■

Who you gonna call? Ghostbusters. The pop song of the film hums in your mind as the computer game of both loads into your 64.

Now we all know that a good film or a good pop song is no guarantee of a good game – many games players have learned this lesson the hard way.

My suspicious nature is quickly put at ease when I read that the ghost offering is the work of David Crane. In case you haven't heard Crane's the name that keyed *Decathlon* and *Pitfall 1* and *2* for Activision.

The game begins in generous fashion by giving you £10,000. But before you start planning a world cruise this is not holiday money but working capital.

You must use your cash to equip your ghost catching business. You'll need a vehicle and traps to catch the spooks.

The amount of money you speculate on equipment must be recouped when you set out on your rounds freeing the neighborhood of its unwanted ghostly inhabitants.

In true American tradition the idea of the game is to make as much money as

is that there are two players racing against each other to achieve this objective.

By pressing the fire twice a pointer appears at a display of six gadgets to the left of the screen. From this list you can select a time bomb, bomb, gun on a string, fire bucket, spring, and map.

These booby traps are used to impede your opponents progress and earn bonus points.

The map will show you your position in the embassy but loses you points each time you use it.

If you happen to walk into the same room as the other spy you can either engage him in hand to hand combat or you can scarper.

The key to success in *Spy* is to keep an eye on what your opponent is doing at the same time as planning your own strategy.

The animation of the spies is ex-

Spy Vs Spy is a sure fire hit and welcome addition to any 64 owners' games collection.

Up to four players can play the game using the computer just to keep the score and act as a board or, up to three players can take on the computer.

In my opinion the game is at its best when used by one person playing against the computer. The computer is a much better opponent than a human being – not just because on its high skill levels it can play a very good game of Scrabble but also because it won't keep you waiting.

One drawback of the multiplayer option is that your opponents will have to seat themselves in rotation around the 64. Certain of the game-play options mean that your opponents will also have to look away from the screen whilst you think about your next move, consider the computer prompts, and look at your tray of tiles.

If you like Scrabble and you've got a 64 you won't want to be without this game. If it were not for this silly load time Scrabble would have ousted *Zaxxon* from the Screen Star spot.

---

you finally succeed it doesn't half feel good.

The game is moderately amusing and a brave attempt to try something different. Somehow though – it doesn't quite work.

I found it repetitive and lacking any real challenge – not really a game for the experienced player.

One day cartoon animation will make computer graphics a thing of the past as far as games are concerned. But before that happens all micros will have to be compatible with cheap, fast, laser disk units.

Attempting cartoon games without this technology is like trying to play Mozart on the spoons.

---

sound effects and a more fluid animation of the running movement of the athletes.

Although Activision performed well the gold medal has to be awarded to Quicksilva for the game licensed from Epyx – *Summer Games*.

This really is something special. *Summer Games* is also the most original of the Games games – as it involves more than simply yanking the living daylights out of your joystick.

The graphics really have to be seen to be believed. Eight brilliantly animated events plus an opening ceremony with white doves flying up into the sky and eighteen national flags for you to choose your favourite country.

The winning medals for the best Games game in the Commodore User Challenge are awarded as follows: Gold: Summer Games, Silver: Decathlon, and Bronze: Daley Thompson's Decathlon.

---

possible by trapping the ghosts and reaching the top of the Zull Tower with at least two of your fellow ghostbusters still alive.

The game still uses the buzz words from the film – ghosts are called "slimers" and the villains "marshmallow men". But are people going to know what these strange words mean as the game is launched several weeks before the film? Yes says an Activision spokesman "the kids know what marshmallow men are". Who's he calling a kid?

The catchiness of the pop song has not escaped the manufacturers attention and the player is enduced to join in with the Ghostbusters chant at certain points in the game.

The acid test for games based on film and books is would they still be good games if you have never heard of what ever it is they are supposed to be about. In this case the answer is yes – excellent sound and graphics and a playable game. One gripe though – why should disk owners have to pay twice as much for the game as people buying it on cassette?

• SCREEN STAR •



Zaxxon
Commodore 64
Joystick needed
U.S. Gold
Price £9.95



Presentation:	■■■■□
Skill level:	■■■□□
Interest:	■■■□□
Value for money:	■■■■□

When Sega's *Zaxxon* hit the arcades two years ago hardened *Space Invader* fans couldn't believe the quality of the graphics. True scrolling 3D graphics, accurate response to joystick, beautiful colours and a thumping good shoot 'em up to boot.

Now this reviewer can't believe the game has been so faithfully recreated on a home computer.

Had I not played the game with my own joystick I wouldn't have believed it – especially as I'd seen a couple of previous attempts on other micros fail dismally.

It's taken several months and a legal wrangle to get the game into the shops after Synapse UK – a manufacturer of business software and totally unconnected with the top American games house – slapped a writ on U.S. Gold stopping them from importing the game under the Synapse name.

A slight name change has enabled U.S. Gold to get the game out crediting it to a company called Synsoft – wonder what that reminds you of.

Let me say straight away that this legal arrangement is good news for 64 games as *Zaxxon* is set to become one of those games that no self-respecting Commodore owner would want to be without.

For the uninitiated the game is basically a space scenario shoot 'em up. The object of the game is to destroy the evil Zaxxon – a giant robot that you can confront only after you have blasted your way through several preliminary levels.

The first of these is the flying asteroid city. You must destroy as many of the enemy ground installations as possible in this level. The more enemy aircraft you destroy here the less you will encounter in deep space later in the game.

What makes the asteroid city the trickiest part of *Zaxxon* is the walls and electronic fences – over and through which you have to negotiate your shuttle craft.

On your first few cities the walls and fences are wide and far apart but on later ones you will need very skillful joystick control to get through the narrow gaps.

If you get through the asteroid city your next challenge is a shoot-out in deep space. This calls for a really quick finger on the fire button as you do battle with the aliens that you did not destroy on the ground.

Success in deep space also depends on correctly judging the distance and approach of the aliens – no simple duck shoot this.

Now comes the final conflict as you seek to destroy the Zaxxon robot on the last remaining asteroid city. To do this you will have to score three direct hits on its missile launcher.

The robot is a difficult moving target and is armed with deadly seeker missiles.

It will take you a good few hours play before you even get on to the right city to take on Zaxxon – and several more hours before you get the better of him.

If you manage this the game begins again only now it is faster and more difficult. The score you notched up in the previous game is what you take with you so it is possible to achieve some really ridiculously high scores – if, that is, you have the skill.

Quite simply the best shoot 'em up for the 64.



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SCREEN SCENE

Rapier Punch
Vic-20
Software Projects
Price £5.95

Presentation: ■■■□□
Skill level: ■■■□□
Interest: ■■■□□
Value for money: ■■■■□

Just when you thought all the Vic-20 games had dried up Commodore have launched a super new 100 screen game for the unexpanded machine.

Yes, you heard me right, one hundred screens on an unexpanded Vic.

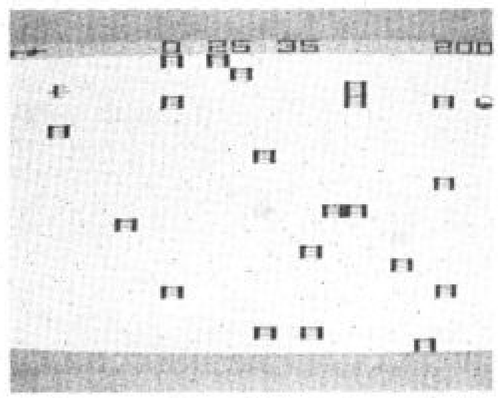
The object of the game is to find the treasure chest hidden in one of the darkened rooms.

But before you set out on your quest be warned – there are nasties in those rooms, waiting to pounce on unsuspecting treasure seekers.

As you explore, more of the area turns white – as you leave a trail behind you.

The nasties are the usual assortment of dragons, dragons' eggs, spinning crosses and barriers. Barriers are small blocks through which you cannot move. It is very difficult to avoid these barriers as they are invisible.

I enjoyed *Rapier Punch* – it's a considerable programming achievement on the Vic-20.



Perils of Willy
Vic-20 with 16K
Software Projects
Price £5.95

Presentation: ■■■□□
Skill level: ■■■□□
Interest: ■■□□□
Value for money: ■■■□□

Vic owners have had to look on in envy over the last few months as *Jet Set Willy* and *Manic Miner* have topped the charts with 64 and Spectrum owners reaching for their wallets in thousands.

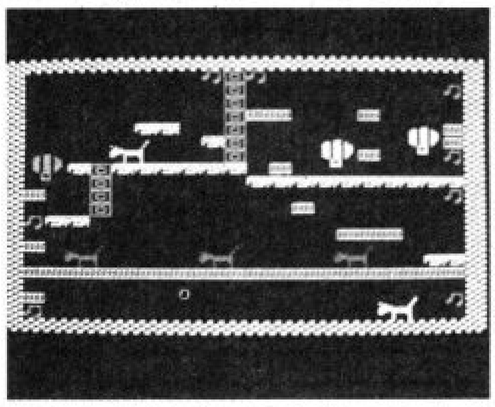
Well now it's your turn to get some of the action as Software Projects have launched a Willy game for Vic owners with a 16K RAM pack.

Miner Willy is faithfully depicted in Vic graphics right down to his most distinguishing feature – his bowler hat.

In this Willy game our hero has discovered music and sets out to collect all the musical notes from the fourteen screens.

It lacks the original's zaniness – somehow Miner Willy isn't quite Miner Willy without Martha, man-eating toilets, and mutant telephones.

That said – it's still a good game in its own right. It will take several day's play to get to the top of that fourteenth screen.



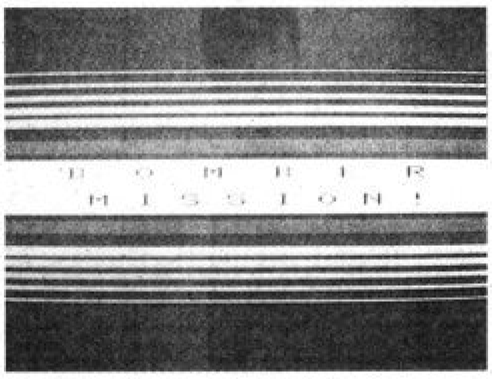
Bomber Mission
Vic-20 with 16K
Commodore
Price £4.95

Presentation: ■■■■■
Skill level: ■■■■□
Interest: ■■■■■
Value for money: ■■■■■

Eleven gauges plus a radar screen give the promise of an involved simulation. All the controls are accessed through the function keys and the joystick. You are given the choice of three targets followed by a selection of payloads (various bombs and fuel pods) which should enable you to successfully complete your mission.

It's easy to take off and operate the flaps and undercarriage; setting course is just a matter of leaning on the joystick. Providing you've flown high enough at a reasonable cruising speed to conserve fuel and not suffered a terminal hit from the interceptors, the bombs can be released when the target distance reads zero.

The way the gauges and controls are explained within the program is fine but I had the uneasy feeling that there were a few bugs drifting around in the coding. Despite two approaches and an eventual show of concern, Commodore did not supply a replacement copy: draw your own conclusions.



Wunda Walter
Vic-20 with 16K
Interceptor
Price £6.99

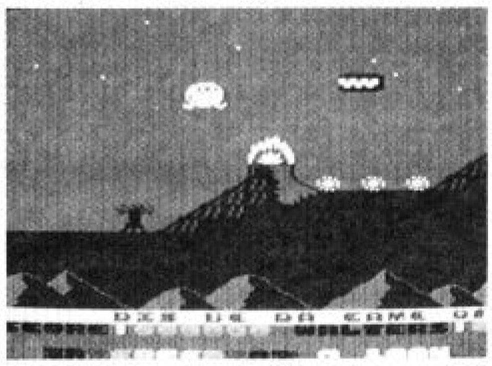
Presentation: ■■■■■
Skill level: ■■■□□
Interest: ■■■■□
Value for money: ■■■■■

Wobbly, wacky and welcome is *Wunda Walter*. This is a funky, nonsense game requiring aeronautical skills and an aptitude for executing telling belly-flops. Guide Walter in a flight across four distinctive, scrolling landscapes, swooping down to the ground to steam-roller small, evidently offensive globes then lurching into the stratosphere again to avoid prickly vegetation and abrasive rocks. As you soar over hills and valleys, keep an eye out for maurauding balloon-bustas bearing in mind that errupting volcanoes ain't too healthy for wind bags either.

The title screen depicts the four regions which are to be your stamping ground: a red volcanic region; white icy wastes; a tropical sector; an arid yellow desert.

Overall, a first rate fun game full of colour and even a scrolling commentary.

With the success of *Arabian Knights* under their belts it looks like being a very good year for Interceptor.



Trollie Wallie
Commodore 64
Interceptor
Price £7.99 cass £9.99 disk

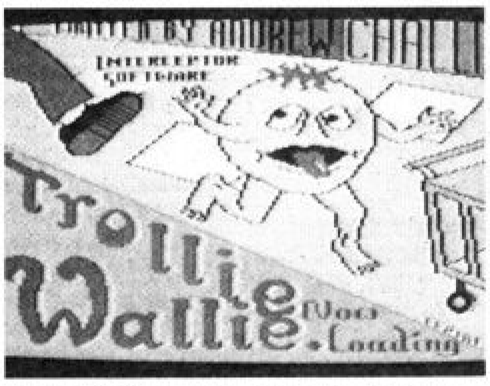
Presentation: ■■■■□
Skill level: ■■■■□
Interest: ■■■■□
Value for money: ■■■■□

Supermarket shopping is not my ever-loving's idea of fun, so he fully sympathised with poor old Wallie and his daunting task of collecting 40 assorted items from an a-maze-ing supermarket. The supermarket abpounds with all sorts of obstacles and problems, around which you have to guide Wallie, and once he has collected five items (which is the maximum his trolly will carry) he has to take them to the cash desk and pay for them before he can go on to collect the next five items.

If you find the way barred by a brick wall, you have to go back and find the switch that will make it fall before Wallie can proceed with his task. You will need quick reactions and a lot of initiative.

Yet another fast loader (hurrah!) albeit in fits and starts, good graphics and sound and instructions are written in verse.

Another good game for the Vic-20 – and a very welcome launch too with the current shortage of Vic games.



SCREEN SCENE

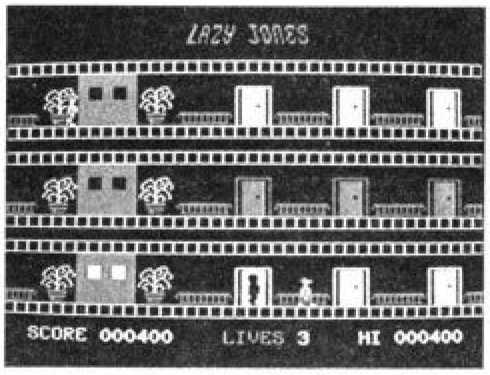
Lazy Jones
Commodore 64
Terminal
Price £7.95

Presentation: ■■■■□
Skill level: ■■■□□
Interest: ■■■■□
Value for money: ■■■■■

Lazy Jones is a series of games in one game where you must become Lazy Jones, the laziest and most skilled shirker in the business, whose only ambitions are to improve his games-playing and avoid work at all costs. In the hotel which has the misfortune to 'employ' Lazy Jones there are 18 rooms, most of which have their own computer games which you, as Jones, take every opportunity to play instead of cleaning. Occasionally you hide in the broom cupboard or bathroom to avoid being caught by your irate Manager, or the ghost of the previous manager, or to avoid running into your cleaning trolley and having a heart attack at the thought of work.

The games beyond the doors shown on the screen-shot feature some startling graphics. One of the shoot 'em ups has a series of spinning metalic rectangles that gyrate towards your gun turret.

Fast loading, catchy tunes and good graphics made this the most enjoyable program I've seen this week.



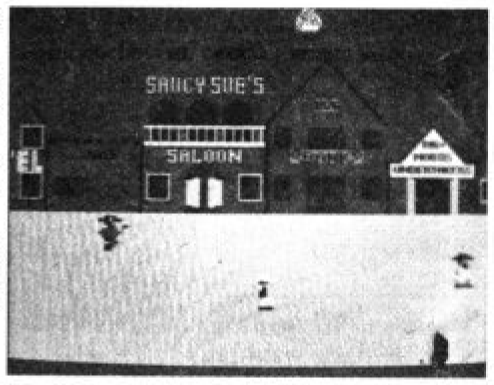
High Noon
Commodore 64
Ocean
Price £7.90

Presentation: ■■■■□
Skill level: ■■■□□
Interest: ■■□□□
Value for money: ■■□□□

Latter day Garry Coopers will be in their element, yet others will find that the cassette case gathers dust after the novelty wears off. This is not a run of the mill shoot out; the graphics are 3D, so you may move anywhere on Main Street slinging the lead about. As you mosey on out of the jail house the outlaws amble into town: shots are fired in any of the standard eight directions. The outlaws are set on robbing the bank and abducting women but with your sharp shooting, the undertaker will be the one carting the goods. It is possible to hide in the bank or saloon.

I've only seen two Ocean programs and both were subject to lapses in the action under certain conditions. Probably this is just coincidence but I certainly should like to see more of their products.

One excellent feature of *High Noon* is the music – an upbeat 'High Noon'. The game is the work of Andy Spencer of *International Soccer* fame.



Catastrophes
Commodore 64
Mirrorsoft
Price £6.95

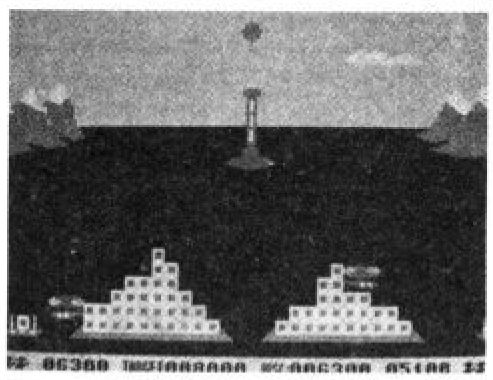
Presentation: ■■■■□
Skill level: ■■■□□
Interest: ■■■□□
Value for money: ■■■□□

Dear Mirrorsoft, this game is intended for the under eights, right? If so ... great, if not ... oh dear! Those of very tender years should enjoy hoisting building blocks from cargo ships and constructing hotels on a small offshore island, using a helicopter as a transporter. Two young Mr McAlpines may play, exercising their dexterity is skillful block-placement and avoiding the occasional low-flying jet.

To fulfill their contract, a predetermined schedule has to be adhered to. But thwarting their efforts are hurricanes, electrical storms, earthquakes and floods, each of which destroys part of the buildings.

A perky little tune, punctuated by sound effects, accompanies the job in hand, which apart from being good Play School fun is a dramatic introduction to the slings and arrows of outrageous misfortune. Thankfully a demo-mode is featured.

Another winner from Mirrorsoft.



Bristles
Commodore 64
State Soft
Price £8.95 cass £10.99 disk

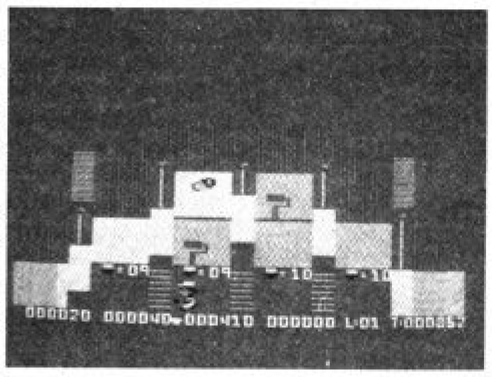
Presentation: ■■■■□
Skill level: ■■■□□
Interest: ■■■□□
Value for money: ■■■■□

There are eight houses in need of sprucing-up, each more difficult to re-decorate than the last. Multiply by six skill levels and you end up with 48 different screens.

Each room in a house is painted simply by walking through it. Lifts are a vital ingredient in this medley which also features various itinerant paint buckets; they are your roving hazards. A little sweetie-pie is ever ready to dab her mits all over your handy work but she can be kept amused and out of harms way with a supply of candy-canes.

Now we can't do without bonus objects so there's paint rollers full to collect. Watch out for the steam pipes from building five onwards. Get the picture? A classic scenario given a fresh coat of paint.

Much use is made of the Nutcracker Suite; coupled with the ability to select the painter's gender and we have a program well suited to the family. A good example of its kind and another excellent import from State Soft.



Sorcery
Commodore 64
Virgin
Price £7.95

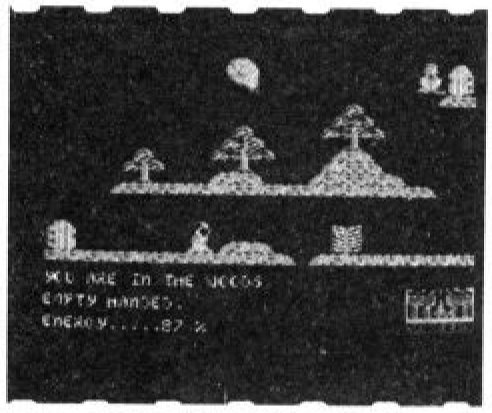
Presentation: ■■■■■
Skill level: ■■■□□
Interest: ■■■□□
Value for money: ■■■■□

An insistent rendition of the "Sorcerer's Apprentice" sets the scene; thunderclaps throughout the game maintain the feeling of a dark, mysterious age. You need to journey through 17 screens avoiding the touch of energy-draining forces of evil, collecting various objects and using them to expedite your progress. Casting spells, guzzling potions, swashing a few buckles, SEQUENCING actions correctly plus dexterity with the joystick may eventually see you through to Stonehenge. You travelled all that way through murky forrests, dank dungeons, flying over watery graves and similar locations with one object in mind – to defeat the Necromancer.

Apart from being harrassed by ghosts and ghouls there are snap decisions to make en route ... adventure style.

The whole presentation appealed, the "stage sets" being unusual. It could be that by the time the early screens are easy meat, the game might pall ... still that's entirely subjective.

Virgin's best game since the screen-scorching *Falcon Patrol I* and *II*.



Raid over Moscow
Commodore 64
U.S. Gold
Price £9.95

Presentation: ■■■■■
Skill level: ■■■■■
Interest: ■■■□□
Value for money: ■■■□□

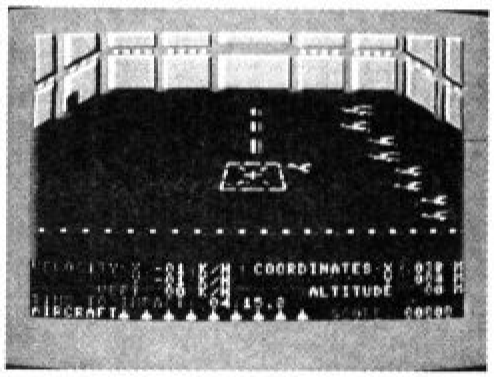
Raid Over Moscow is the follow-up to Bruce Carver's excellent *Beach-Head*.

Unlike *Beach-Head, Raid Over Moscow* places you in the cockpit of the world's fastest fighter bomber. You must lead your men on a bombing mission over the main industrial centres of the Soviet Union, in an attempt to knock out the computer installations which are guiding a salvo of nuclear warheads across the North Atlantic to targets in Canada and the U.S.A.

You must guide your ship out of the landing bay and fly it through space towards the Soviet capital.

The plane must be flown very low to avoid being detected by the Russian radar network. Jet planes, patrolling tanks and stationary guns all take a pot shot at your plane.

Raid Over Moscow scores highly on graphics and playability. The game is much more difficult and challenging to play than *Beach-Head*, and will certainly take a lot to master.



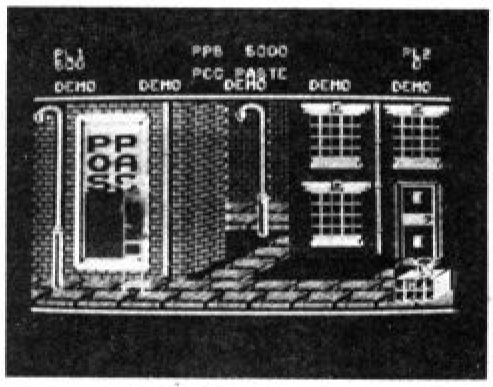
Poster Paster
Commodore 64
Taskset
Price £6.90

Presentation: ■■■■■
Skill level: ■■■□□
Interest: ■■■■□
Value for money: ■■■■■

To the best of my knowledge this is completely original – certainly very playable anyway. You have to slap up bill hordings, with one sheet sufficient to complete screen one and twelve required for the final triumph, after which there is a riddle to solve.

Initially the correct roll of paper needs selecting, then the ladder has to be lugged into position and climbed. If your judgement was sound, as you press the fire button the roll will unfurl and stick; should you have the wrong roll or be out of alignment it's back to the drawing board. A few figments of Taskset's imagination waltz across the pavement attempting to frazzle you, and horror of horrors, water-down your carefully mixed paste!

A few well aimed flicks with the brush should skittle them: best to keep an eye on the Paste Condition Guage though, 'cos if it turns to stodge you're defenceless. Let it be said that life up the ladder is not without complications – don't lean too far.



Ancipital
Commodore 64
Llamasoft
Price £7.50

Presentation: ■■■□□
Skill level: ■■■□□
Interest: ■■■■□
Value for money: ■■■■□

The launch of a Jeff Minter game is something of an occasion in the computer gaming world – not least because every Minter offering so far has been different.

Jeff's latest – *Ancipital* is no exception to this rule.

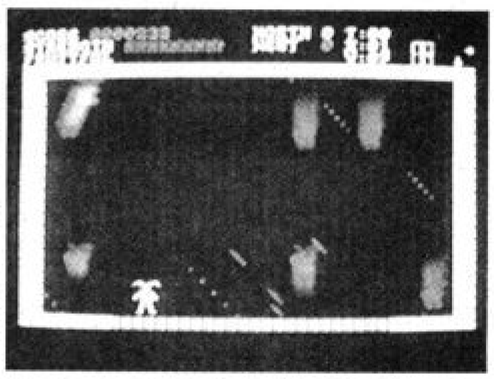
The game takes its name from the strange horned beast that you play in the game – guiding it through no less than a hundred screens.

In true Minter tradition the game has an element of super-fast nastie zapping.

Getting from screen to screen is only possible after shooting the interconnecting doors at the right moment.

Ancipital has lots of animals all over the place including some camels – the Minter trade mark. A guest appearance is also made by Neil from *The Young Ones* – whom as you might imagine is one of Jeff Minter's favourite actors.

I liked *Ancipital*, it's very playable, and keeps you amused with lots of wise cracks and zany graphics. Could be Minter's best yet.



Ant Attack
Commodore 64
Quicksilva
Price £8.95

Presentation: ■■□□□
Skill level: ■■□□□
Interest: ■■□□□
Value for money: ■■□□□

When *Ant Attack* was launched on the Spectrum last year its "solidsoft" 3D graphics made hardened games reviewers gasp.

But there has been a lot of good games released since last year and the quality of graphics is now incomparably higher than it was when *Ant Attack* was first launched.

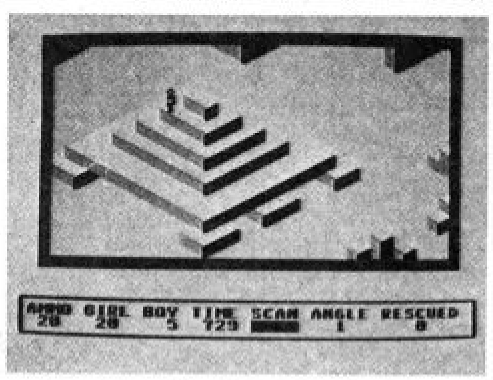
And certainly as far as graphics on the 64 are concerned the game is not in a league of its own. Half a dozen games that I can think of are at least as good if not better.

All you have to do is rescue the girl or boy trapped in the walled city of Antescher.

The game gets more difficult as on subsequent rescue attempts you have to first locate the captive.

Your only defence against the giant ants are 20 hand grenades.

There is also a timer which ticks away. Points are awarded for the number of ants destroyed and rescues carried out.



Pitfall II – Lost Caverns
Commodore 64
Activision
Price £10.99

Presentation: ■■■□□
Skill level: ■■■□□
Interest: ■■■■□
Value for money: ■■■■□

Pitfall I was such a success on the Atari VCS that gamers demanded and got a sequel. Now both games are available on the 64.

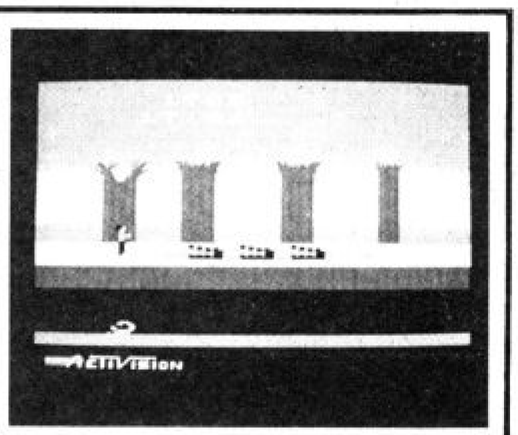
Pitfall II takes the basic treasure seeking idea of the game but adds a vertical dimension. And when I say vertical I mean vertical – some of the those caves seem to go down for ever.

The ultimate aim of the game is to find the lost Raj Diamond hidden somewhere in the caves.

Nasties to overcome include flying bats, poisonous frogs, scorpions, electric eels and – worst of all – the giant condors.

I personally rate *Pitfall II* higher than the first game. It's more difficult and will consequently take you longer to crack. The game also has a sensible marker system that avoids you having to go right back to the beginning of the game each time you get zapped – you just go back to the last marker.

It's not necessary to have *Pitfall I* to enjoy the sequel and vice versa.



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The Vic Adventurer's Guide

a comprehensive games roundup

Most good computer adventures need lots of memory, which means that the Vic, with its miserly 3.5K memory, looks like being a non-starter; especially since software houses are devoting their attention to the eminently more suitable Commodore 64.

But the dedicated Vic adventurer still has a variety of games to choose from. Stephen Williamson introduces the different types of game you can expect to find in the shops. And he's compiled a comprehensive and up-to-date checklist of the adventure games available. Looks like there's more Vic adventure-fodder available than you thought? **by Stephen Williamson**

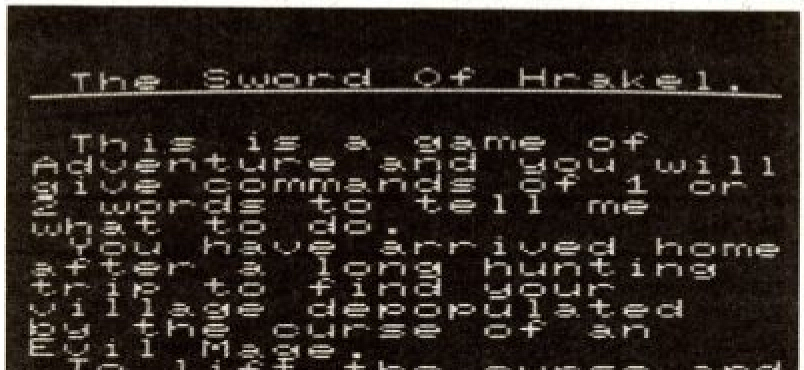
Adventuring with words

First let's consider text-based adventures, an art pioneered by the near-legendary Scott Adams. His series of adventures is available on cartridge from **Commodore**. These can all be relied upon to contain intriguing puzzles and well-written scenarios, but don't expect to find hundreds of locations. Notable Adams works are *Adventureland*, suitable for beginners as well as stretching the imagination of the more experienced adventurer; and *The Count*, perhaps the most difficult of the series to solve.

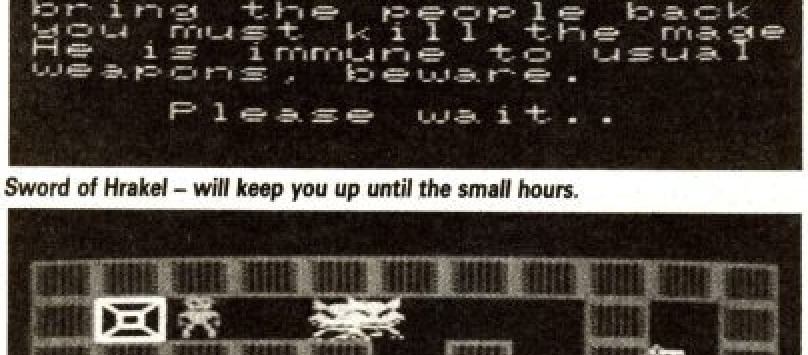
Kraal's Kingdom is a 32K text adventure from **Buntasoft** which overcomes the Vic's memory limitations by loading in two 16K sections. The code needed to play part two must be discovered in part one. The adventure incorporates some neat sound effects – doors breaking with a bang when you smash them open and you can hear the river water rushing below you as you try to cross the broken bridge. At £4.95 Kraal's Kingdom is very good value for money and takes lots of patience, ingenuity and imagination to complete.

For sci-fi fans Buntasoft has written science-fiction adventure, *Marooned*, in which you search an alien planet for a spare part needed to repair your damaged spacecraft.

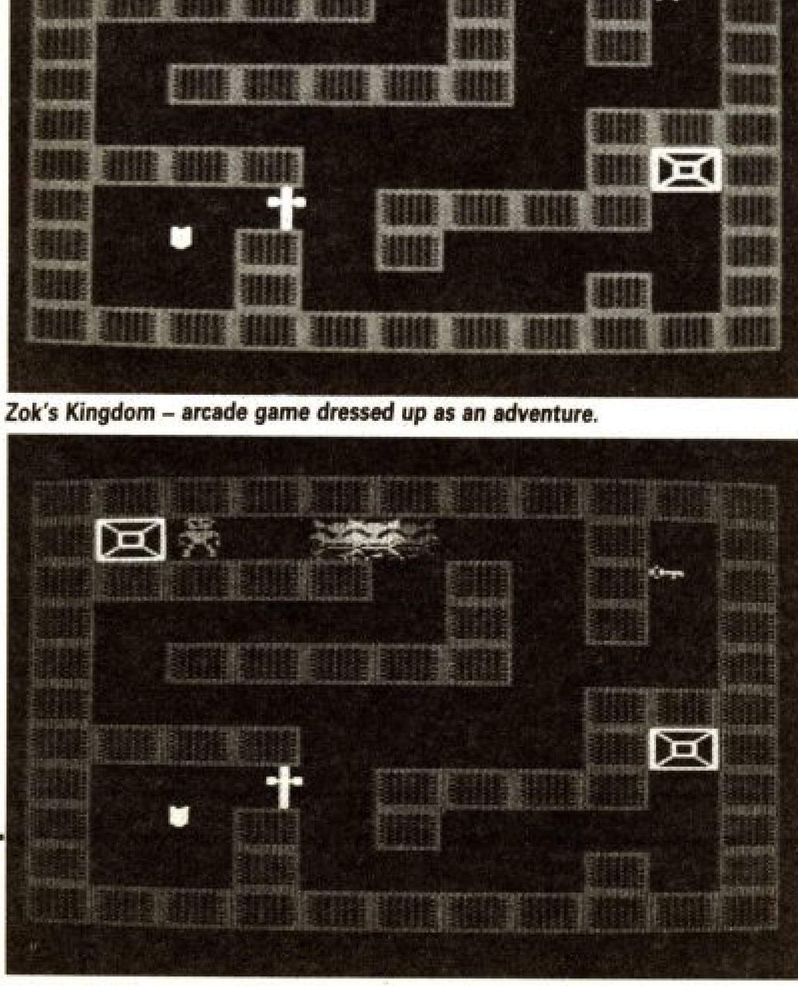
Romik has issued a low price four-game pack: three text adventures together with a set of puzzle and strategy programs called *Mind Twisters* – all for £10.98. *The Golden Apples of Zeus* is a gentle introduction to the world of adventure with comprehensive instructions, simple problems and few locations – definitely not for the experienced adventurer. But



Sword of Hrakel – will keep you up until the small hours.



Zok's Kingdom – arcade game dressed up as an adventure.



Pharoah's Tomb – another arcade game posing as an adventure.

Animal Magic and *Sword of Hrakel* are something completely different and are worth buying the set for. Both games fulfill the required criterion – that you end up playing them until the early hours of the morning, determined to get just that little bit further into the adventure. In Animal magic as dawn broke I reminisced on my night's quest. I'd dehydrated in the desert, nearly froze to death in the forest, got turned into a frog and overcome a herd of elephants by a very simple device that had taken ages for me to work out. And all this in search of a baby kidnapped by an eagle. Certainly makes a change from all those distresed princesses that I usually have to rescue in adventure games. As for The Sword of Hrakel, how do you catch the attention of a meditating guru and of what use is an agitated duck?

The three **Terminal Software** text adventures I've played : *Magic Mirror, Rescue from Castle Dread* and *Curse of the Werewolf*are all worth tackling. I particularly liked the Curse where attacking monsters do not always kill you outright but gradually weaken your constitution whilst you struggle to find ways of killing or getting past them. A weak constitution reduces the number of objects that you can carry. Some objects are placed randomly so that each time the game is played things are not always the same. Tricky stuff.

Martech's *The Quest of Merravid* finds you seeking the magical firestone hidden by a dragon. A fairly short adventure and not too difficult to solve but with some touches of humour. I tried making love to the serving maiden in the tavern but had trouble with her big brother when he saw me. I did a lot of

drinking in that tavern.

Finally, *Exploring Adventures on the Vic* is a three adventure cassette published in conjunction with a book of the same name by Peter Gerrard where full listings for the adventures can be found. A line by line commentary on *Underground Adventure* is an excellent introduction to the art of writing adventure programs, though the game itself requires a 32K RAM expansion to play which must surely limit its market.

Graphic Adventuring

Graphic adventures for the Vic vary from those like *Dungeons* which require a measure of strategy and foresight to play, to **Sumlock's** *Starship Escape* which relies more on quick reactions and the 'shoot 'em up skills' of the arcade game. Several have a similar theme – a man wandering around various chambers battling guards and searching for treasure.

Outstanding amongst this type of game is *Pharoah's Curse* from **Hesware**, available on 'turbotape' which, by some miracle of programming takes just over a minute to load the 16K program. It's a game for adventure and arcade fans alike. The action takes place in various sections of Pharoah's Tomb and is fast and furious with mummies to fight, traps to avoid, treasure and keys to steal, doors to unlock, ropes to climb, lifts to ride and a winged avenger who carries you off to the darker recesses of the tomb. Graphics and sound are excellent and I am swiftly becoming a Pharoah's Curse addict.

After trying Pharoah's Curse I was eager to get to grips with *The Wizard And the Princess*,



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Supplier	Title	Expansion	Type
Anirog	Dark Dungeons	16K	G
Anirog	The Dungeons	16K	G
Anirog	Dracula/Lost in the Dark	unexp	G
Anirog	Zok's Kingdom	16K	G
Anirog	Pharoah's Tomb	16K	G
Argus	Cells and Serpents	16K	G/T
Argus	Demon Knight	16K	G/T
Argus	The Valley	16K	G/T
Argus	White Barrows	16K	G/T
Audiogenic	Tomb of Drewan	16K	G
Buntasoft	Death House	16K	G
Buntasoft	Kraal's Kingdom	16K	T
Buntasoft	Marooned	16K	T
Buntasoft	Vortex	16K	T
Buntasoft	72 Hours	16K	T
Scott Adams Series:–			
CBM	Adventureland	unexp	T
CBM	The Count	unexp	T
CBM	Mission Impossible	unexp	T
CBM	Pirate Cove	unexp	T
CBM	Voodoo Castle	unexp	T
Duckworth	Exploring Adventures on the Vic	16K/32K	T
Haresoft	Hareraiser	16K	G/T
Hesware	Pharoah's Curse	16K	G
Lyversoft	Sphinx	16K	G
Martech	Quest of Merravid	16K	T
Melbourne	Wizard and Princess	unexp	G
Maplin/Epyx	Sword of Fargoal	16K	G
Maplin/Epyx	Rescue at Rigel	16K	G
Mr. Micro	Gold Rush	unexp	G
Mr. Micro	Mysterious Island	16K	G
Mikro-Gen	Mines of Saturn/Return to Earth	8K	T
Phoenix	Four Gates to Freedom (arcade game plus text adventure in one package)	16K	G/T
Quicksilva	Trader	16K	G
Rabbit	Colnel's House	8K	T
Romik	Animal Magic	16K	T
Romik	Sword of Hrakel	3K or 8K	T
Romik	Golden Apples of Zeus	16K	T
Sumlock	Starship Escape	16K	G
Terminal	The Curse of the Werewolf	16K	T
Terminal	Magic Mirror	8K	T
Terminal	Rescue From castle Dread	16K	T

from **Melbourne House**. It's a five part graphical adventure for the unexpanded Vic that has featured in the Vic best-seller lists for some time – someone out there must like it. Sadly, I casme away disappointed after only a few minutes.

The games are written in Basic with unimpressive graphics and have the flickery animation that mars many a Basic game. After playing each game, or 'chapter' as the instructions call them you have to wait until the next section loads. You must find a castle, battle a dragon, get lost inside a 3D maze, rescue a princess and take her across a bridge guarded by a Troll – all in a day's work, no doubt.

Zok's Kingdom and *Pharoah's Tomb* from **Anirog** are two more examples of the graphical character wandering around various chambers. But whilst there are some monsters to avoid, the emphasis in both games is on problem solving; finding just the right equipment needed to enter locked chambers, cross moats or lighten darkened rooms. Zok's Kingdom should baffle you for a while, though Pharoah's Tomb suffers from a man who wanders painfully slowly across the screen in response to pressing direction keys.

The same criticism applies to the hero in **Audiogenic's** *The Tombs of Drewan* who meanders through the silent, (no sound in this one), 400 chamber tomb. Each guard encountered has a different strength value, so weapons must be chosen carefully. A powerful petrify spell is wasted on a weak guard. No puzzles to solve here; you just search for the four magical runestones and an amulet. There is a save game facility to allow you to go to bed and live to fight another day. Not a classic, but worth a few games.

Trading with aliens

The Trader from **Quicksilva** is a science fiction adventure in three 16K parts in which you play the role of a trader wheeling and dealing with various aliens on planets within the Meridien System. The object of the game is both to survive and to make a fat profit after your journey to the alien worlds. Some simple arcade games are included to liven things up a bit. And random elements provide some variety each time the game is played.

There are some nice pictures to look at. Fine examples of what can be achieved with a bit of ingenuity using those built-in Vic low-res graphics characters. I enjoyed my first trading journey, though I did fall down a pit to my doom near the end of the adventure, and I drove some hard bargains. However, after a few plays, the novelty of the game began to wear off. There did not seem enough stimulation in Trader for the game to have lasting appeal.

One of the first non-computer role-playing games was Dungeons and Dragons, a complex game using lots of dice, players jotting things down with pencil and paper, in which a fantasy world was created in the imagination populated with heroes, monsters, magic, and the like which often took place within the confiners of a dungeon system. *The Dungeons* and *Dark Dungeons* from **Anirog** are two games written by the same author that seem to recreate some of the appeal of Dungeons and Dragons.

A character is generated by the computer who possesses attributes like strength, intellect and dexterity. You choose to be a fighter or a magician and after purchasing waepons and equipment, you are plunged into a 3D maze dungeon inhabited by monsters who guard treasures, weapons and items needed in your quest. Single letter commands are used to make decisions about movement, combat, taking objects, drinking potions and consuming food (which must be taken at regular intervals to prevent starvation). Survival is difficult and requires judgement and strategy as well as a fair amount of luck.

Dark Dungeons uses a similar system to Dungeons but has a different set of monsters and torches which burn out very quickly leaving you to wander around in darkness. It may lack the problem solving of some adventure games, or the fast action of Pharoah's Curse, but it's very challenging and will grow on you.

So it looks as though there's a reasonably wide range of adventure games available on the Vic, for all tastes and levels of expertise. But according to almost all of the software houses, you can expect little in the way of new adventures in the near future. Only one software house, Sophisticated Games, had anything new to report – a 350 location, ten-part adventure called *Loves's Labours*, coming soon.

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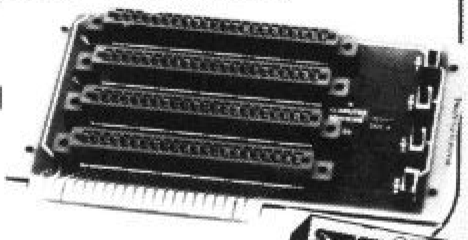
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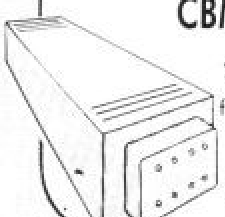
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Victuals

HOW TO TYPE IN VICTUALS

How we reproduce listings

We have two methods of presenting listings. When we can, we run them through a converter program that replaces the hieroglyphic control codes with more meaningful symbols.

When you see	It means...	And you...
[CU]	cursor up	press the 'cursor up' key (shifted)
[CD]	cursor down	press the 'cursor down' key
[CL]	cursor left	press the 'cursor left' key (shifted)
[CR]	cursor right	press the 'cursor right' key
[HOM]	cursor to the top lefthand corner	press the HOME key
[CLS]	clear	press the CLR key (shifted)
[DEF]	change to insert	press the INSert key (shifted)
[BLK]	change to black	press the BLK key (CTRL and 1)
[WHT]	change to white	press the WHT key (CTRL and 2)
[RED]	change to red	press the RED key (CTRL and 3)
[CYN]	change to cyan	press the CYN key (CTRL and 4)
[PUR]	change to purple	press the PUR key (CTRL and 5)
[GRN]	change to green	press the GRN key (CTRL and 6)
[BLU]	change to blue	press the BLU key (CTRL and 7)
[YEL]	change to yellow	press the YEL key (CTRL and 8)
[REV]	reverse on	press the RVS ON key (CTRL and 9)
[OFF]	reverse off	press the RVS OFF key (CTRL and 0)
[SPC]	space	press the space bar repeat the specified number of times

When you see any of the codes prefixed by a number, you must press the appropriate key the same number of times.

for example:
[3SPC]
means – press the spacebar three times

or

[5CD]
means – press 'cursor down' key five times

[G<key]	**press specified key together with CBM key**
[G>key]	**press specified key together with CBM key**

These listings we generally run out on a letter-quality printer, though, and conventional graphics can't be handled on a daisywheel. So some listings are done on a Commodore printer, in which case you may see the standard control codes:

```
                                   (REVERSED HEART)
CLR            ...                 (REVERSED S)
HOME           ...                 (REVERSED R)
RVS ON         ...                 (REVERSED UNDERSCORE)
RVS OFF        ...                 (REVERSED SHIFTED *)
CURSOR UP      ...                 (REVERSED Q)
CURSOR DOWN    ...                 (REVERSED UPWARD BAR - SHIFTED H)
CURSOR LEFT    ...                 (REVERSED LEFT SQUARE BRACKET)
CURSOR RIGHT   ...

 SET COLOUR TO                     (REVERSED SHIFTED P)
          BLACK  ...               (REVERSED E)
          WHITE  ...               (REVERSED £)
          RED      ...             (REVERSED COMMODORE-SHIFTED *)
          CYAN   ...               (REVERSED COMMODORE-SHIFTED -)
          PURPLE ...               (REVERSED UP ARROW)
          GREEN  ...               (REVERSED LEFT ARROW)
          BLUE   ...               (REVERSED PI SIGN)
          YELLOW ...
THE FUNCTION KEYS CAN BE INCORPORATED INTO PRINT STATEMENTS TOO.
AS WITH THE OTHER NON-ALPHANUMERIC KEYS, THEY APPEAR AS SPECIAL"

SYMBOLS IN A LISTING                  F2   ...
F1   ...                              F4   ...
F3   ...                              F6   ...
F5   ...                              F8   ...
F7   ...
```

HORSE RACES –

by Hadge Smith

Good graphics and sound make this a good game for 1 to 6 people to indulge their passion for the Turf. Each punter gets £100 with which to place bets on a series of six races to see who comes top of the Winnings Table. It's probably not up to ITV Seven status but at least your money is safe.

```
5 POKE36879,8:PRINT"[CLS][WHT]PLEASE WAIT..."
10 POKE52,28:POKE56,28:CLR:CC=0:DIMJ(6),L(10),M(10):CO=30720:S1=36876
20 POKES1+2,15:FORI=0TO511
30 POKE7168+I,PEEK(32768+I):NEXT
40 FORI=0TO23:READA
50 POKE7648+I,A:NEXT
60 FORI=1TO6:READB$(I):NEXT
70 DATA0,1,3,63,95,27,8,4
75 DATA64,208,184,252,228,160,16,32,128,128,128,128,128,128,128,128
80 DATA"PIXEL QUEEN","SUPER SPRITE","BASIC BLUES","VIC THE LAD","SYNTAX ERROR"
90 DATA"VERIFY"
100 FORI=0TO10:READL(I),M(I):NEXT
110 DATA212,2,233,1.5,233,1.5,233,1.5,229,1.5,229,1.5
120 DATA229,1.5,223,1.5,229,1.5,223,1.5,212,8
200 PRINT"[CLS]HOW MANY PUNTERS":INPUT"(1-6)";PU:IFPU<1ORPU>6ORPU<>INT(PU)THEN20
0
210 DIMNA$(PU),G(PU),E(PU),V(PU):FORI=1TOPU
220 PRINT"[CLS]"I:G(I)=100:INPUT"NAME (8 LETTERS MAX)";NA$(I)
230 IFLEN(NA$(I))>8ORLEN(NA$(I))=0THEN220
240 NEXT
500 POKE36869,255
510 CC=CC+1
530 H=0:FORY=1TOPU:H=H+G(Y)
535 IFG(Y)=0THENE(Y)=0:V(Y)=0:GOTO580
540 PRINT"[CLS]":F=1:FORK=7725TO7945STEP44:J(F)=K:POKEJ(F),60:POKEJ(F)+1,61
545 POKEJ(F)+CO,F:POKEJ(F)+1+CO,F:F=F+1:NEXT
550 PRINT"[HOM][CD]":FORZZ=1TO6:PRINTTAB(7)B$(ZZ):PRINT:NEXT
555 PRINT"[HOM][CYN]"NA$(Y)" CAPITAL \";G(Y)
560 INPUT"[RED][13CD][2SPC]PICK YOUR WINNER[2CD][13CL][GRN](1 TO 6)[YEL]";E(Y)
565 IFE(Y)<1ORE(Y)>6ORE(Y)<>INT(E(Y))THEN540
570 PRINT:PRINTTAB(8)"STAKE";:INPUTV(Y):IFV(Y)<>INT(V(Y))THENPRINT"[CLS]WHOLE PO
UNDS ONLY!"
575 IFV(Y)>G(Y)THENPRINT"[CLS]YOU CAN'T AFFORD IT!"
577 IFV(Y)<>INT(V(Y))ORV(Y)>G(Y)THENFORR=1TO1500:NEXT:GOTO540
580 NEXT:IFH=0THEN2500
660 PRINT"[CLS]RACE"CC
670 A=7702:B=7966:FORC=0TO21:POKEA+C,195:POKEB+C,195:NEXTC
680 FORD=0TO264STEP22:POKE7723+D,62:NEXT
690 I=1:FORD=J(1)TOJ(6)STEP44:POKED,60:POKED+1,61:POKED-1,I+48:POKED+CO-1,1
700 POKED+CO,I:POKED+CO+1,I:I=I+1:NEXT
705 GOSUB950
710 X=INT(1+6*RND(1))
720 POKES1+2,1+X
```

Here's a brief description of the program structure:

The main variables used are:-
NA$ – Punters Name
B$ – Horses Name
G – Capital
V – Stake
E – Selection
J – Position of Horse

Lines 5- 120
Poke Data and set variables for sound and colour

Lines 200- 240
Ask How many Punters, Dim Arrays And ask for Punters Names

Lines 510- 580
Set up screen for each Punter to input selection and stake, with Punters name, capital and a list of runners. (See Screen Dump) In line 510, CC is the Race Number. In line 530, H is a default value to terminate the series of races if all Punters are broke. Error Traps are contained in lines 565—577 for wrong inputs.

Lines 660- 705
Set up the Race Track with the horses at the start and Go-Sub 950—960 to play music (Fanfare).

Lines 710- 770
The heart of the program where X in line 710 decides which horse should move, line 730 moves the horse and colour, lines 720 and 740 create the sound of



```
730 J(X)=J(X)+1:POKEJ(X),60:POKEJ(X)+1,61:POKEJ(X)+CO,X:POKEJ(X)+1+CO,X:POKEJ(X)
-1,32
740 POKES1+2,0
750 FORZ=7744TO7964STEP44:IFPEEK(Z)=61THEN800
760 NEXT:BB=1
770 GOTO710
800 PRINT"[13CD]THE WINNER IS NO.";X
810 PRINT"[CD]"B$(X);
820 Y=INT(1+10*RND(1))
830 IFY=1THENPRINT" AT EVENS[CD]":GOTO850
840 PRINT" AT"Y;"[CL]/1[CD]"
850 FORI=1TOPU:IFE(I)=XTHENGOSUB1000:PRINTNA$(I)" BACKED IT!":G(I)=G(I)+(Y*V(I))
:GOTO870
860 G(I)=G(I)-V(I)
870 NEXT:PRINT"[CD][5SPC]PRESS A KEY"
880 GETV$:IFV$=""THEN880
890 IFCC=6THEN2500
900 PRINT"[CLS]":POKES1+2,15:GOTO510
950 FORN=0TO10:POKES1,L(N):FORP=1TOM(N)*100:NEXT:POKES1,0:NEXT
960 PRINT"[HOM][8CR]THEY'RE OFF!":RETURN
1000 POKES1+2,15:FORR=200TO240:POKES1,R:FORT=1TO30:NEXTT,R:POKES1,0:RETURN
2500 IFPU=1THEN2555
2505 PRINT"[CLS]":FORI=1TOPU-1:E=0
2510 FORJ=1TOPU-1
2520 IFG(J)>=G(J+1)THEN2540
2525 P=G(J):C$=NA$(J):G(J)=G(J+1):NA$(J)=NA$(J+1)
2530 G(J+1)=P:NA$(J+1)=C$
2535 E=1
2540 NEXTJ
2545 IFE=0THEN2555
2550 NEXTI
2555 PRINT"[CLS][4SPC][GRN]WINNINGS TABLE[2CD][CYN]"
2560 FORK=1TOPU:PRINT"[CD]"K" "NA$(K)TAB(14)"\"G(K):NEXT
2570 PRINT"[3CD][2CR]ANOTHER GO (Y/N)?"
2580 GETA$:IFA$="Y"THEN2600
2585 IFA$="N"THENPOKE36869,240:END
2590 GOTO2580
2600 PRINT"[CLS]SAME PUNTERS(Y/N)"
2610 GETA$:IFA$="Y"THENFORI=1TOPU:G(I)=100:E(I)=0:V(I)=0:NEXT:CC=0:POKES1+2,15:G
OTO510
2620 IFA$="N"THENRUN
2630 GOTO2610
```

galloping horses and line 750 checks to see if a horse has reached the winning line.

Lines 800- 900
Print out the winning horse's Number and Name, who backed it and the starting price (Set by Y) and adjusts the capital of each punter.

Lines 2500-2550
Sorts out the Winnings Table in order of capital remaining after 6 races.

Lines 2555-2560
Prints out the Winnings Table.

Lines 2570-2590
"Another Go?" Routine.

Lines 2600-2630
Asks if same Punters are playing. If so, resets variables and returns to initial screen. If not, Auto-runs.



KEY REPEAT – FOR THE COMMODORE 64

This short routine lets you print any character repeatedly on the screen just by continuing to hold the key down. The routine is not affected by Basic because it's written in machine-code and is set up in the cassette buffer.

by William Fong

Once you've typed the program in, you enable it (and disable it) by pressing F1. Then, if you hold a key down for more than half a second, the character is printed over and over again until the key is released. Pressing Runstop/Restore totally disables the routine, but it can be recalled with SYS 832. Remember, once you've typed in the listing, make sure you SAVE before you RUN or you will lose everything.

```
0 REM REPEAT : (C) WILLIAM FONG 1984
1 PRINT"[CLS][WHT]":POKE53280,0:POKE53281,0:FORN=832TO886:READD:POKEN,D:NEXT:SYS
832:NEW
3 DATA120,173,20,3,141,46,3,173,21,3,141,47,3,169,89,141,20,3,169,3,141,21,3,88
4 DATA96,165,197,201,4,240,7,201,5,240,11,108,46,3,169,128,141,138,2,108,46,3,1,
69
5 DATA0,141,138,2,108,46,3,32
6 DATA120,173,20,3,141,46,3,173,21,3,141,47,3,169,89,141,20,3,169,3,141,21,3,8,8
```

PRINT AT – FOR THE COMMODORE 64

This simple routine lets you place text anywhere on the screen, without using all those tedious cursor commands. Remember, SAVE the loader before you RUN it, otherwise the NEW command in line 30 will destroy all your efforts.

by Fred Reid

When run, the FOR-NEXT loop in line 30 POKEs the code into the protected memory area above 49152. The routine can be used in program or direct mode, and is called by **SYS49264,Y,X,"text"** where y is the vertical component between 0 and 24, and x is the horizontal component between 0 and 39. Be careful when printing to screen line 24, as this causes the screen to scroll.

```
1 REM** 'PRINT AT' - EXAMPLE
2 :
3 :
10 PRINT"[CLS]"
20 FORP=24TO1STEP-1
30 SYS49264,P,P,"WHAT ?"
40 NEXTP
```

```
1 REM** 'PRINT AT' SUBROUTINE
2 :
3 REM**USE AS SYS49264,Y,X,"TEXT"
4 :
5 REM**WHERE Y=0TO24 & X=0TO39
6 :
7 REM**      BY FRED REID
10 :
20 FORI=0TO57
30 READA:POKEI+49264,A:NEXT:NEW
40 DATA32,241,183,134,87,32,241
50 DATA183,134,88,224,40,176,6
60 DATA165,87,201,26,144,3,76
70 DATA72,178,32,102,229,165,87
80 DATA240,9,169,17,32,22,231
90 DATA198,87,208,247,165,88,240
100 DATA9,169,29,32,22,231,198
110 DATA88,208,247,32,253,174,76
120 DATA160,170
```

AUTO-LINE

Here's a useful little listing that will help you save time when writing your own programs or copying listings from magazines.inst time.

The Auto-Line numbers line numbers by simply pressing return.
This means that you don't have to keep stopping to check what line number you should be entering and helps you avoid mistakes.

You'll find it particularly useful on longer programs.

by William Fong

```
0 REM AUTO-LINE : (C) WILLIAM FONG
1 PRINT"[CLS][WHT]":POKE53281,0:POKE53280,0:FORN=49152TO49256:READV:POKEN,V:NEXT
N:SYS49152
3 DATA169,48,133,2,133,4,133,5,133,6,169,49,133,3,120,169,27,141,20,3,169,192,14
1
4 DATA21,3,88,96,165,211,201,1,208,6,169,60,197,197,240,3,76,49,234,169,0,133
6 DATA211,169,48,162,4,213,2,208,5,202,224,255,208,247,232,134,198,160,0,136,181
7 DATA2,153,119,2,200,202,224,255,208,245,230,198,169,32,153,119
8 DATA2,162,1,246,2,169,58,213,2,208,9,169,48,149,2,232,224,5,208,239,76,49,234
```

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Q: Which spreadsheet offers an advanced level of formula handling?

A: Autocalc 64 copes easily with trignometrical functions, parenthesis and boolean logic as well as totalling and averaging.

Q: Which spreadsheet accepts complex conditional statements?

A: Autocalc 64 can handle statements as complex as IF a1<4,000 OR a1>8,000 AND a2 = 500 THEN b1=0.

Q: Which spreadsheet offers a flexible screen format?

A: Autocalc 64 allows you to select (i) column widths from 3 to 30 characters (ii) the number of rows/columns you need (iii) up to 2,000 cells of information (iv) text or numerical entries lined up to the right or the left, or a combination.

Q: Which spreadsheet offers a choice of numerical formats?

A: Autocalc 64 gives you a choice of (i) integers (ii) floating decimal point (iii) currency (iv) any combination of these.

Q: Which spreadsheet offers a full 'replicate' facility?

A: Autocalc 64 has an advanced replication function for transferring text, data, formulae or conditional statements from any cell (or block of cells) to any other(s) without monotonous retyping. A 'go to' facility will take the cursor instantly to any cell of your choice — saving time.

Q: Which spreadsheet is easy to use yet advanced in operation?

A: Autocalc 64 is designed to guide you — helpful error reports diagnose input or formulae errors. A full demonstration program and comprehensive instructions are included.

Q: Which spreadsheet is compatible with standard Commodore printers?

A: Autocalc 64 gives you a printout facility using any of these printers: Commodore 1515, 1525, MPS 801, 1526, MCS 801, DPS 1101, Seikosha GP100VC.

Q: Which spreadsheet is 100% machine code for fast efficient responses, and offers a choice of saving to disk (using 1541 drive) or to tape using a C2N unit?

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Victuals

PLOT YOUR BIORYTHMS





A little practical program for the Commodore 64 to try on your 1520. It's ideal for plotting your own Biorythms, which for those of you who have never heard of them, are the basic 'life-cycles' which vary our physical, emotional and intellectual abilities from day to day.

by Chris Durham

The three cycles change at a different rate to each other. The Physical cycle has a 23 day period, the Emotional cycle has a 28 day period and the Intellectual, a 33 day period. From the day you're born these cycles are constantly changing their relationship, but there are certain factors that are constant. Above the central line they are said to be **positive**, below the line they are **negative**. When they *cross* the central line, they are said to be **critical**. That means that on a critical day you're more prone to making errors or poor judgements – of course that doesn't mean to say you *will* have a bad day.

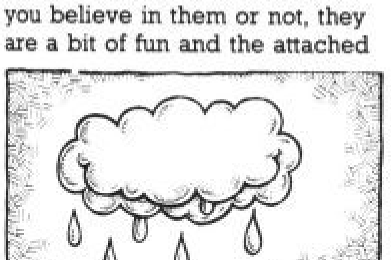
Some Japanese companies take particular note of their delivery drivers' biorythms; and they claim accidents have been reduced by warning the drivers when they are liable to be less alert than normal. But, whether you believe in them or not, they are a bit of fun and the attached program can be used on anyone born after 1900. All you have to specify is the date of birth and the month for which you want the biorythms plotted. All dates should be put in with the day, month and year separated by commas (eg 21,10,56).





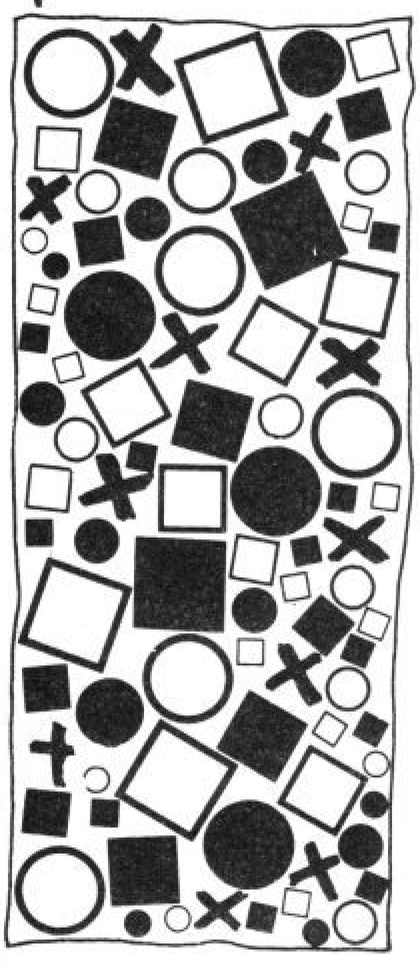


```
10 REM BIORYTHM PROGRAM FOR THE
20 REM   1520 PLOTTER & CBM 64
30 REM       BY CHRIS DURHAM
40 REM *************************
44 DIM MAX(12),DY(12)
46 FOR LP=1 TO 12: READ MAX(LP): NEXT
48 FOR LP=1 TO 12: READ DY(LP): NEXT
50 PRINT"<CLR><CUD><CUD><WHT>BIORYTHMS PROGRAM"
60 PRINT"<CUD>ENSURE 1520 PLOTTER SET UP WITH PENS IN"
70 PRINT"AND SWITCHED ON - 'RETURN' WHEN READY"
80 GETA$: IF A$="" THEN 80
90 OPEN4,6 : REM ASCII PRINTING
100 OPEN1,6,1 : REM X,Y DATA
110 OPEN2,6,2 : REM PEN SELECT
120 OPEN3,6,3 : REM CHAR SIZE
125 OPEN7,6,7 : REM PLOTTER RESET
128 PRINT#1,"M",0,-600:PRINT#1,"M",0,-100: PRINT#4
130 PRINT"<CLR><CUD><CUD><CUD>INPUT DATE OF BIRTH IN FORM DD,MM,YY"
140 INPUT DD,MM,YY: YB=0
150 GOSUB 1000
160 IF ER=1 THEN 130
170 DB=DD: MB=MM: YB=YY: YB=YB+1900
180 INPUT"<CUD><CUD>MONTH & YEAR REQUIRED (MM,YY)";MM,YY
190 DD=1: YY=YY+1900: GOSUB 1000
200 IF ER=1 THEN PRINT"<CLR><CUD><CUD>": GOTO180
210 GOSUB 2000
220 TD=DD+DY(MM)+(INT(YY/4)-INT(YB/4))+((YY-YB)*365)-(DB+DY(MB))+1
230 PY%=TD-((INT(TD/23))*23)
240 IF PY%=0 THEN PY%=23
250 EM%=TD-((INT(TD/28))*28)
260 IFEM%=0 THEN EM%=28
270 IN%=TD-((INT(TD/33))*33)
280 IF IN%=0 THEN IN%=33
290 FOR DY=23 TO 33 STEP 5:PRINT#1,"M",0,0:X=0
300 IF DY=23 THEN PRINT#2,3: CD=PY%-1: GOTO 330
310 IF DY=28 THEN PRINT#2,2: CD=EM%-1: GOTO 330
320 IF DY=33 THEN PRINT#2,1: CD=IN%-1
330 IF CD=0 THEN CD=DY
340 GOSUB 1500
420 NEXT DY
430 PRINT#1,"M",36,-240
440 PRINT#2,3: REM RED PEN
450 PRINT#4,"PHYSICAL  ";
460 PRINT#2,2: REM GREEN
470 PRINT#4,"EMOTIONAL  ";
480 PRINT#2,1: REM BLUE
490 PRINT#4,"INTELLECTUAL";
500 PRINT#1,"M",0,-280:PRINT#4: REM RESET ORIGIN
510 PRINT"<CUD><CUD>ANOTHER CHART? (Y/N) ";
520 GET AN$: IF AN$<>"Y" AND AN$<>"N" THEN 520
530 PRINT AN$: IF AN$="Y" THEN 130
540 PRINT#7:CLOSE7:CLOSE4:CLOSE3:CLOSE2:CLOSE1
550 END
999 REM DATE CHECK ROUTINE
1000 IF DD<1 OR DD>31 OR MM<1 OR MM>12 OR YY<1 THEN 1040
1010 IF DD>MAX(MM) THEN 1040
1020 IF MM=2 AND DD=29 THEN IF INT(YY/4)*4<>YY THEN 1040
1025 IF YB>YY THEN 1040
1030 ER=0: RETURN
1040 PRINT"<YEL>DATE ERROR<WHT> - FORM IS DD,MM,YY"
1045 PRINT"E.G.  18,12,70"
1050 FOR DL=1 TO 1000: NEXT
1060 ER=1: RETURN
1499 REM PLOT GRAPH OF CYCLE
1500 FOR LP=0 TO LM
1510 FA=1.0: FB=8*ATN(FA)
1520 FC=FB*CD/DY
1530 Y=DY*5*SIN(FC)
1540 PRINT#1,"D",X,Y
1550 X=X+15
1560 CD=CD+1
1570 IF CD>DY THEN CD=1
1580 NEXT LP: RETURN
1999 REM PLOT GRID AND HEADINGS
2000 PRINT#1,"M",0,-280: PRINT#4: REM RESET ORIGIN
2010 PRINT#2,0: REM BLACK PEN
2020 PRINT#1,"M",0,240:PRINT#1,"D",0,-240
2030 X=15:Y=215
2040 LM=MAX(MM): IF MM=2 AND INT(YY/4)*4<>YY THEN LM=28
2050 IF LM=29 AND INT(YY/100)*100=YY AND INT(YY/400)*400<>YY THEN LM=28
2060 FOR LP=1 TO LM
2070 PRINT#1,"M",X,Y
2080 Y=-Y
2090 PRINT#1,"D",X,Y
2100 X=X+15
2110 NEXT LP
2115 PRINT#1,"R",X-15,0: PRINT#1,"J",0,0
2120 PRINT#1,"M",156,270
2130 PRINT#4,"BIORYTHM CHART":
2140 PRINT#1,"M",24,245
2145 YY=YY-1900: YB=YB-1900
2150 PRINT#4,"CHART FOR";MM;YY;SPC(5);"DOB:";DB;MB;YB:
2160 PRINT#3,0: REM CHANGE TO 80 CHARS
2170 PRINT#1,"M",0,220: Y=220
2180 FOR LP=2 TO LM STEP 2
2190 X=(LP-1)*15-5
2200 IF LP<10 THEN X=X+3
2210 PRINT#1,"M",X,Y: PRINT#4,LP;
2220 NEXT LP
2230 PRINT#3,1: X=0
2240 RETURN
3000 DATA 31,29,31,30,31,30,31,31,30,31,30,31
3010 DATA 0,31,59,90,120,151,181,212,243,273,304,334
```



Victuals

CROSS COLLECTOR –



A nice'n simple Victual offering that incorporates two essential elements of game-play: increasing difficulty and a race against time.

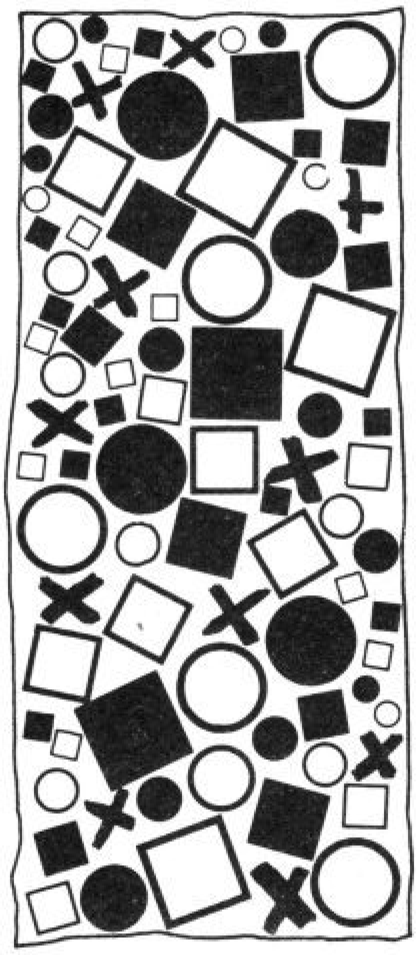
Using the cursor keys to go up, down, left and right, your bouncing spot must collect the crosses and then go to the Home square. Each time you clear the screen, the number of

```
2 REM CROSS COLLECTOR BY MICHAEL KEATING
4 K=1:B=55:W=128
5 TL=999:KK=0
6 IF S=1 THEN S=0
10 PRINT"[CLS]":A=54272:P=53280:POKEP,00:POKEP+1,11:X=20:Y=2
20 FOR R=1984TO2023:POKER,160:POKE 54272+R,14:NEXT
25 FOR R=1944TO1983:POKER,160:POKE 54272+R,14:NEXT
30 FORM=0TOB:H=INT(RND(1)*1000)+944:POKEA+H,11:POKEH,160:NEXTM
40 GOSUB5000
42 FORT=TLTO3STEP-4
50 GETT$:POKE1202,102:POKEA+1202,7
52 IFT$=" "THEN 200
55 PX=1024+X+40*Y:POKEPX,81:POKEPX+A,5
56 IF T$="S" THEN WAIT 198,1
60 IFT$="[CU]"ANDY<>-1THEND=1
65 IFT$="[CD]"ANDY<>24THEND=2
70 IFT$="[CR]"ANDX<>39THEND=3
73 IFT$="[CL]"ANDX<>0THEND=4
74 PRINT"[REV][HOM][23CD]KEYS COL.";KK;" KEYS.";K;" TIME.";T
76 IFD=1ANDPEEK(PX-40)=160ORY=-1THEND=2
77 IFD=2ANDPEEK(PX+40)=160ORY=23THEND=1
78 IFD=3ANDPEEK(PX+1)=160ORX=40THEND=4
```

crosses increases. Too easy for you? Not really, because there are hidden obstacles to block your path – those increase too.

Two nice features: pressing the space bar brings you immediately to the next level, and pressing the 'S' key stops the game.

by Michael Keating



```
79 IFD=4ANDPEEK(PX-1)=160ORX=-1OTHEND=3
80 IFD=1ANDPEEK(PX-40)=86THENKK=KK+1
81 IFD=2ANDPEEK(PX+40)=86THENKK=KK+1
82 IFD=3ANDPEEK(PX+1)=86THENKK=KK+1
83 IFD=4ANDPEEK(PX-1)=86THENKK=KK+1
84 IF T$="N" THEN D=0
92 IFD=1ANDY<>-1THENY=Y-1
93 IFD=2ANDY<>22THENY=Y+1
94 IFD=3ANDX<>39THENX=X+1
95 IFD=4ANDX<>0THENX=X-1
96 POKEPX,32
97 IF KK<=K THEN POKE 1978,15+W:POKEA+1978,14:POKE 1979,11+W:POKEA+1979,14
100 IFKK>=KANDPX=1202THEN 200
150 NEXT:GOTO300
160 END
200 K=K+1:D=0:GOTO 5
300 PRINT"[CLS][4CD][5CR]GOODBYE....":FORY=0TO5000:NEXT:END
5000 FORM=1TOK
5005 H=INT(RND(1)*919)+1024
5006 IF PEEK(H)<>32 THEN 5005
5007 IFH=1124 OR H=1202 OR H=1024 OR H=1063 OR H=1904 OR H=1939 THEN 5005
5010 POKE H+A,1:POKE H,86:NEXT:RETURN
```

book look

A title like The Complete Commodore 64 is a bold one. The 64 has a large repertoire of facilities and to try to include them all between two covers is a mammoth task. Granada have published many books on the 64 by various authors, and have now combined several edited versions into one weighty tome – just in time to capture the Christmas market.

The book is divided into 6 major parts, each one dealing with a particular subject. The first part is by Ian Sinclair from his book *Commodore 64 Computing*. I reviewed this particular work in the October '83 issue. I refer you to it for a detailed dissertation.

The 105 pages on Graphics and Sound is by Steve Money from his book of the same name. It describes character graphics, standard and programmable, including a PRINT AT simulation. High resolution graphics is clearly explained and a short machine code routine to clear the hi-res screen is provided.

The next part is about games, and is mainly from the *Commodore 64 Games Book* by the Bishops. I reviewed this in the February issue and my comments still apply. The games require a lot of work for little result. A few educational games have been included for good measure. I would prefer to have seen this section cut down in favour of a larger section on graphics and sound.

The editor of this compilation is Allan Scott. He and A Bradbury have written a book on adventures for the 64 and 40 pages of it are included. It is well written and entertaining, describing the origin of adventures and some of the techniques used when writing them. Short programming examples are provided and useful text 'crunching' routines are explained. I learned more from these 40 pages than a whole book on the subject from various other authors.

Part 5, Extending your Commodore 64, again by Allan Scott deals with joysticks, cartridges, other languages, disk drives, printers, speech synthesisers, light pens, monitors, modems and networks.

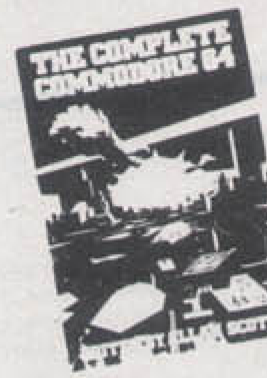
The final section is by Ian Sinclair but this time on the subject of machine code. He offers a sound introduction and does not claim to cover all aspects. Assemblers and monitors are described with particular emphasis on Supersoft's MIKRO 64 assembler package.

Several appendices offer lists of available software and suppliers, Hex to decimal converter, the 6502 instruction set and other odd fragments of information.

For £9.95 you get about five books rolled into one, although *somewhat abbreviated.* Each one normally retails for between £6 and £7. It is excellent value for money and gives you the opportunity to sample the merits of several authors.

Ken Ryder

- **The Complete Commodore 64**
- **by Allan Scott**
- **Granada**
- **£9.95**
- **Highly recommended, a good Xmas present.**



More a collection of magazine articles than a text book, the aim and claim of the 'Screen Shot' series is step-by-step programming. Arranged in sequence, the articles go from absolute beginners right through to writing a simple arcade game.

These books are superbly produced and full of lovely colour. A novel feature is to use photographs of the monitor screen to illustrate examples and show listings – hence the 'Screen Shot' logo. But I found the listings difficult to key in. At 5 lines to the centimetre, the characters are very small and it's not easy to keep a straight edge in place.

Book 1 has the best introduction to Sprites and Sound that I have yet seen, complete with a useful selection of sound routines – engines, lasers, birds and more. otherwise, it adds little to the manual that comes with your computer. Unfortunately the demonstration programs are unimaginative and slow.

The use of ';', CHR$ and even LET (on a Commodore!) makes mountains out of several molehills – a hangover, presumably, of this being one of a collection of such series for various computers.

Book 2 is mainly, but not only, about graphics: including bit map graphics, drawing and filling shapes and more about sprites – both multi-coloured and animated. All this leads up to the usual task of writing a short arcade game. The game works but, written in simple Basic, it won't make a fortune for you in the arcades or software shops. A lot of useful stuff here but to follow the text, photographic listings and Mr. Cornes' individual style of programming takes plenty of patience.

Two books so far, and there are still two more to come – topics, as yet, unspecified. At £5.95 for *each of these 64 page offerings* , this is an expensive, and not always easy, way of collecting some good information and ideas.

George Pike

- **'Screen Shot' Step-by-Step Programming for the Commodore 64. Books 1 & 2.**
- **by Phil Cornes**
- **Dorling Kindersley**
- **£5.95**
- **The conclusion. Lovely to look at, but, at the price, not very good value.**

"A personal voyage of discovery into your home computer", claims the front cover. *Data Log* is a work book to 'teach yourself' to program in simple Basic. Its spaceship and starliner theme are clearly aimed at the younger enthusiast. As well as explanations and programs to type in, there are squared grids on which to design and write your own ideas. All very clearly laid out.

After a short, but adequate, introduction to PRINT statements, the 'voyager' is launched into colours, the FOR:NEXT command, and graphics. Immediately after that, equipment for the Starship Questar must be designed and drawn out. The quick change variety arouses and then holds interest and enthusiasm. A welcome feature is the detailed, and regularly repeated, information on colour codes and screen locations – saves all that looking back.

By the time you've finished the book, most of the Basic commands, PEEK, POKE, keyboard graphics, strings, arithmetic, INT, RND, music, time and sprites have been covered – a comprehensive introduction to the 64. There are separate sections on editing and on error messages – but these are not as detailed as they might be.

There is one important grouse though. I spotted a few simple printing errors: for example, wrong line numbers and FOR T=1TO750: NEXT N. With experience, that's easy enough to sort out, but it's very confusing for the beginner – just who the book is meant for. Otherwise, an excellent, imaginative and fast moving introduction to Basic programming.

Teachers will find Data Log a useful starter book for classroom studies, with plenty of scope to suggest variations and improvements – especially in screen editing.

George Pike

- **Commodore 64 Data Log**
- **by Roger Porkess, Nigel Green, Peter Johnson, and Colin Shearer**
- **Collins Software**
- **£2.95**
- **Good value for money. A sound, but fun, introduction to Basic – *despite the silly mistakes.***

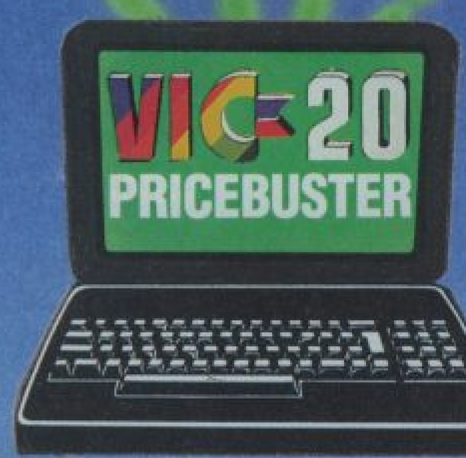
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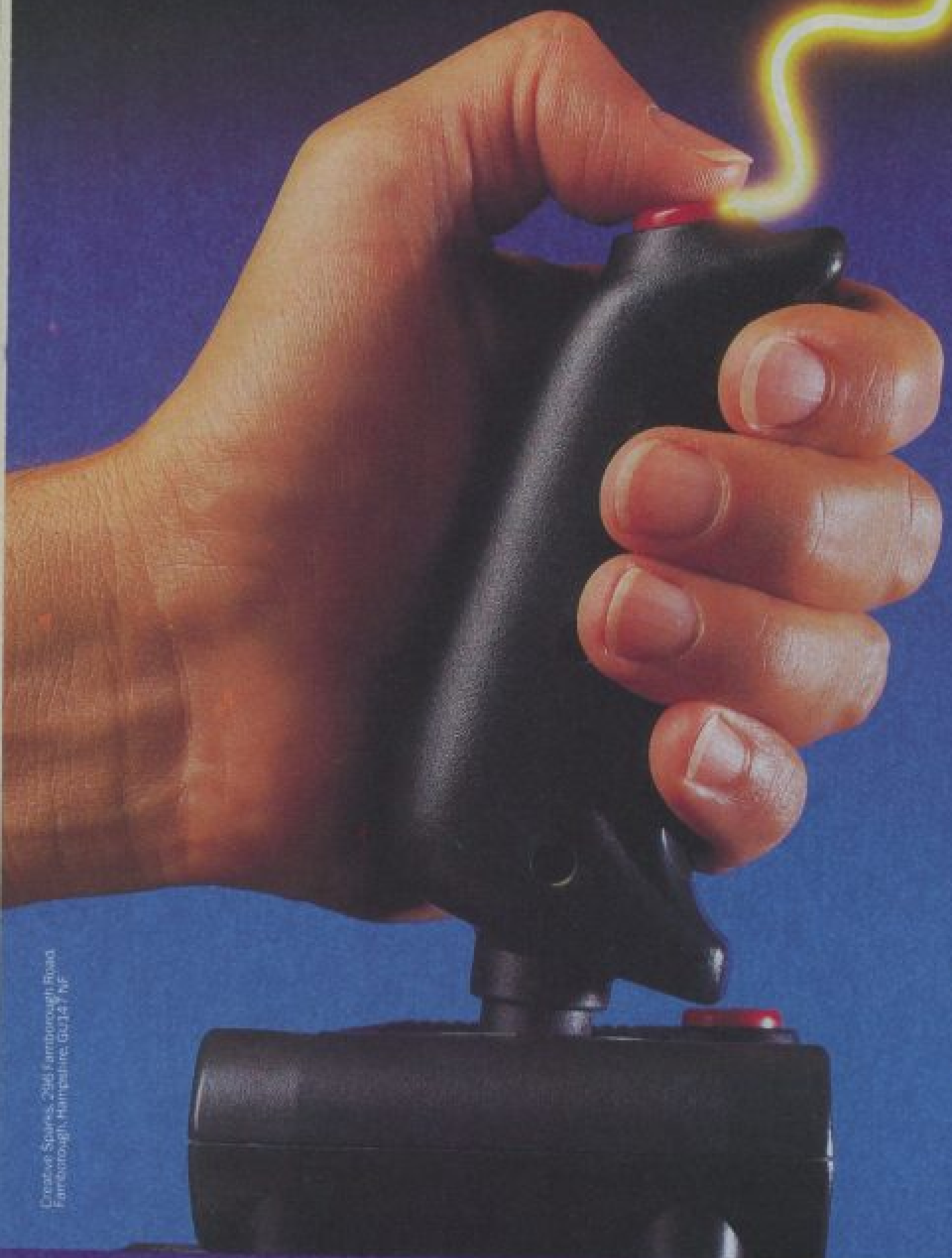
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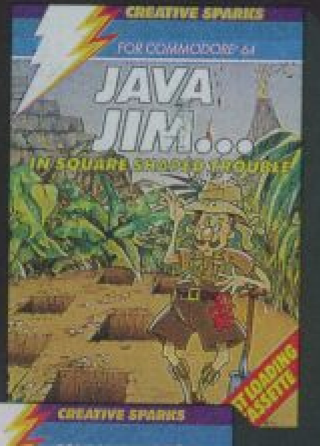
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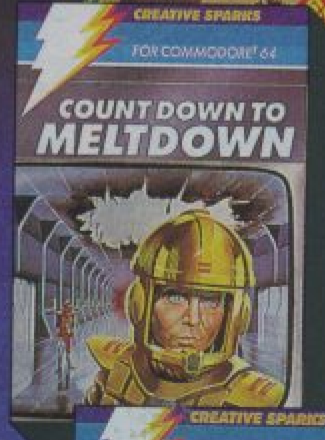
JAVA JIM

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Probably the most exciting game yet developed for the C-64.
Fast loading cassette.



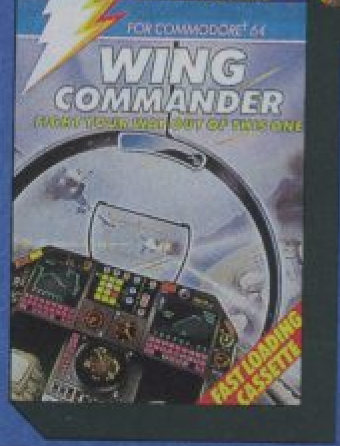
BIRD MOTHER

This is a delightfully original game which uses nature as the setting for a highly compelling and challenging game. Guide the Bird Mother as she builds her nest and raises her young, finally protecting them from a predator hawk.
Fast loading cassette.
The stunning graphics and music in Bird Mother are not to be missed.



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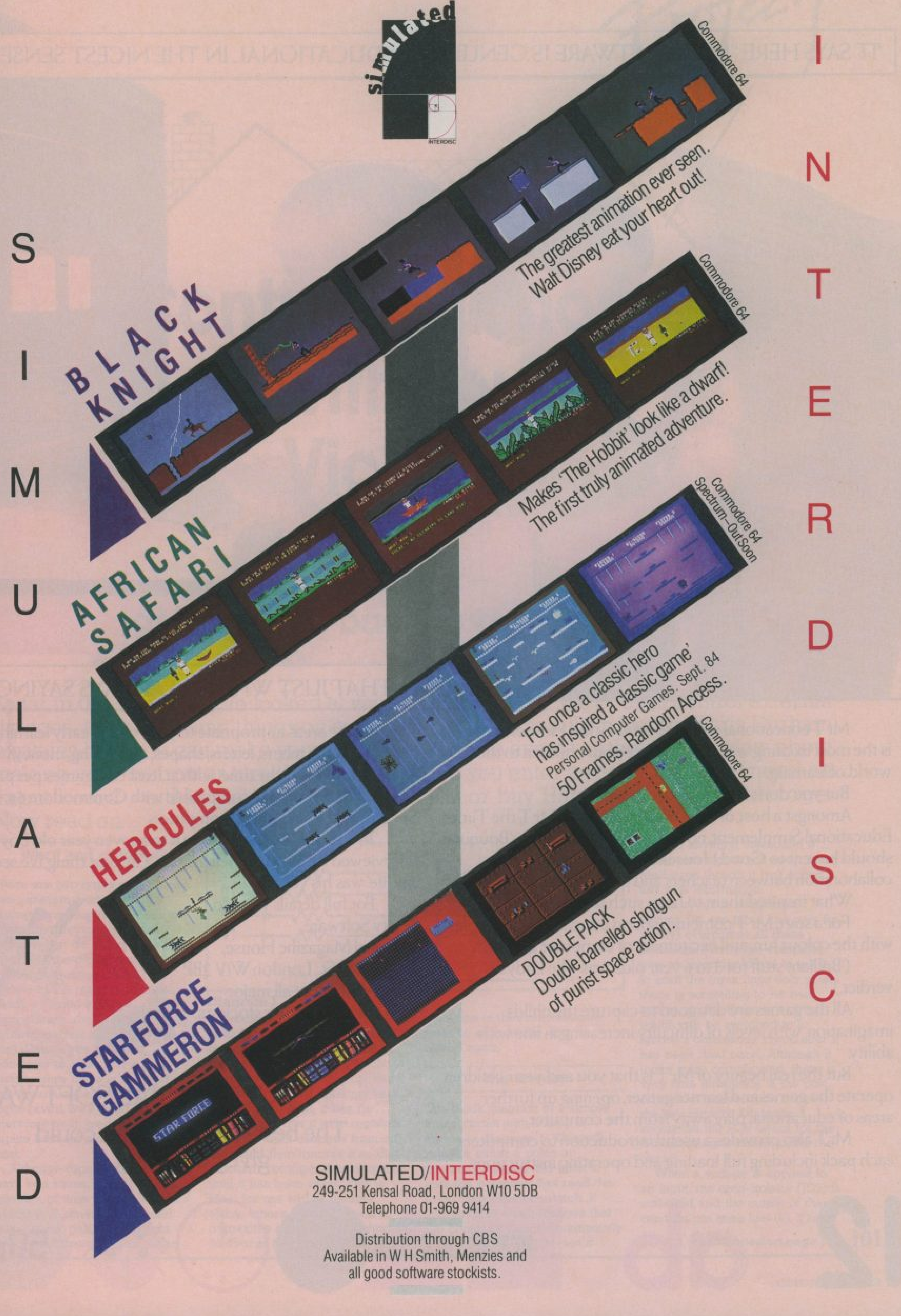
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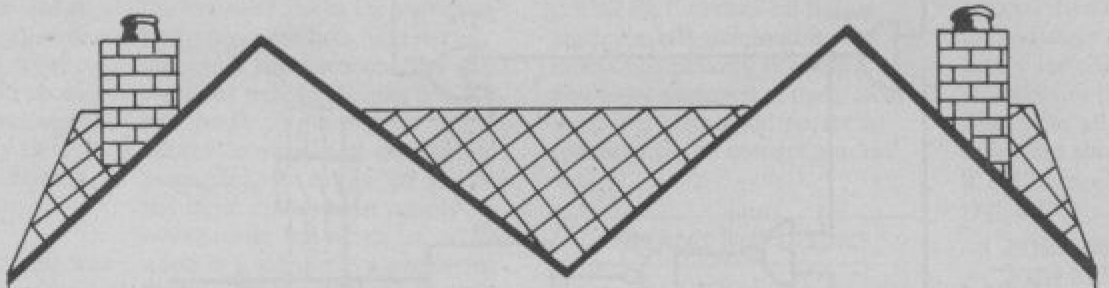
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Control your home with your Vic or 64

Chris Durham

Part four – getting 'feed-back' to your computer

So far in the series, we've looked at ways of getting your Vic or 64 to control external devices, simply turning things on and off at certain times. This month, Chris Durham explains how you can make your computer react to events as they occur. How about making your computer turn the lights on when you enter a room? But you'll need an imput board – either make the one described or buy Handic's VIC-REL cartirdge. Now read on...

What sort of input?

There are two types of input one can generate from sensors; analogue, such as a temperature measuring device; or digital, which is just on and off. For most purposes the digital signal is quite adequate since even a device like a room thermostat sends a digital signal; temperature above the limit (off) or temperature below the limit (on). Unless you want the computer to know the *actual* temperature there is no need to use an analogue sensor. The input board we'll build will therefore limit itself to 4 digital inputs both for simplicity and cost.

Although digital signals only have two states, there is also the element of time to be taken into account. A sensor might send just a quick pulse, or it might send a continuous signal when on, such as the thermostat already mentioned. The board can be used with both types of input since it contains a 'latch', to store the input until the computer is ready to check the input lines. Equally important, it can be switched so that it only registers when an input changes from *off* to *on* and then ignores it so that it doesn't retrigger the computer until it has been reset. This is ideal for use with a security alarm, where you only need to trigger the alarm when a window or door is first opened and the input line is then automatically reset as soon as the door is closed again.

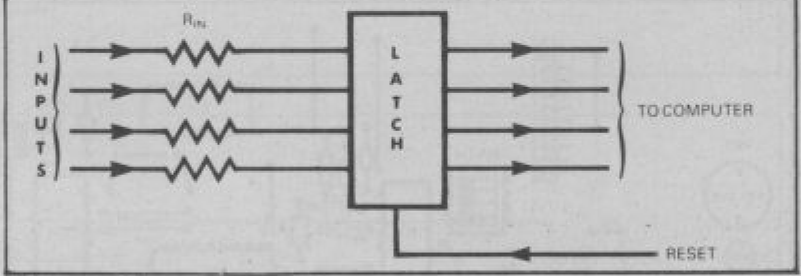


Diagram 1

The Theory

The block diagram of a simple input circuit with a latch is shown in **diagram 1**. This will register either a pulse or continuous signal and latch it until the computer has read the lines, then resets the latch. It suffers from disadvantages that the computer has to continuously scan the input lines to see if there is anything there, and a continuous signal will keep being read even though it isn't giving any new information.

The circuit in **diagram 2** (shown for one input line only for clarity) overcomes all these problems. Firstly the computer gets an interrupt signal to tell it to scan the input lines only when there is something to be read, and secondly, there is a circuit which can be switched in to ignore a continuous signal after it has been read once. Although it looks more complicated, there is very little difference in the cost or ease of construction between the two circuits. **Diagram 3** shows the full PCB layout for the 4-channel input board, using the circuit.

When a voltage is applied to an input, the opto-isolator (IC1) is activated and the output of the relevant pin goes low (0). This is

continued on page 102

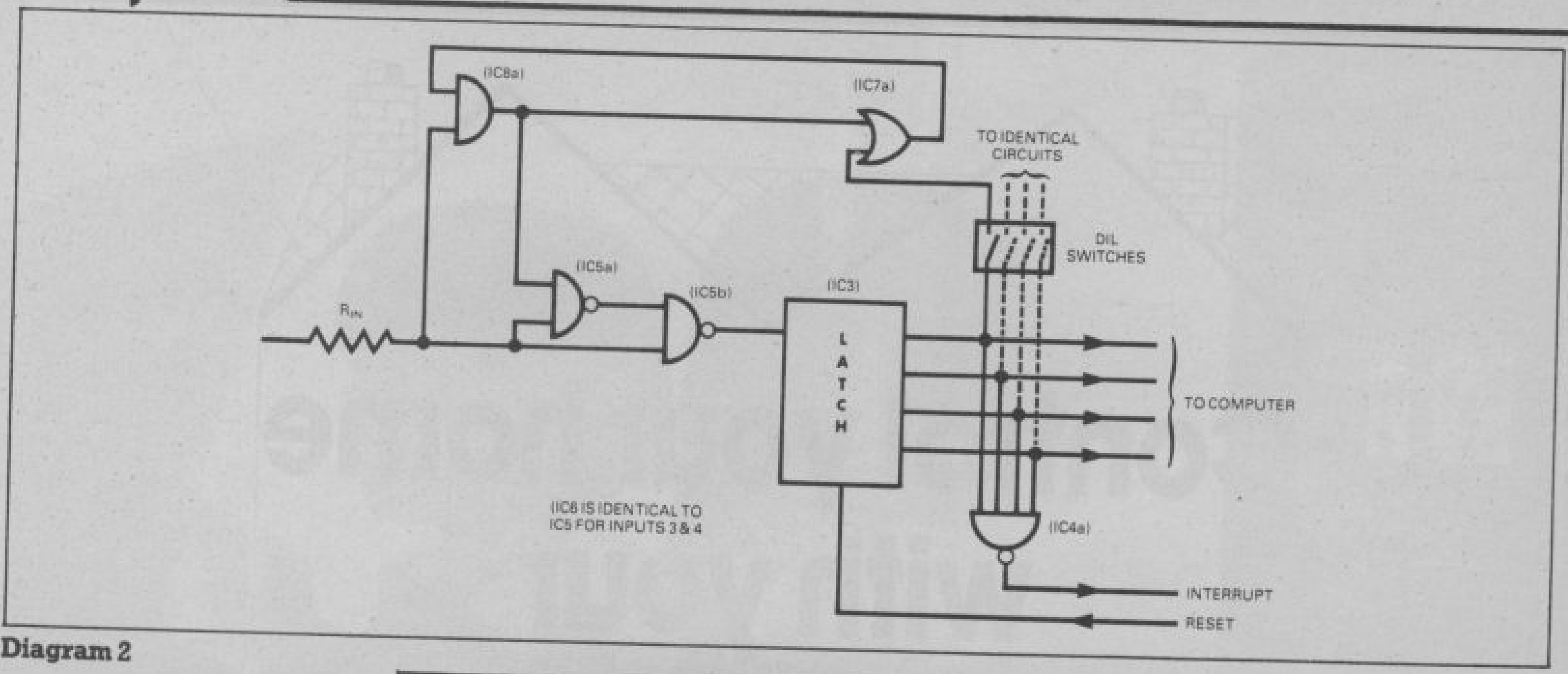


Diagram 2

inverted to a high (1) by the OR gate (IC2) which activates the latch (IC3). The latch then remains high until the computer has read the input, then a reset signal clears the latches on all 4 channels. IC4 is a 4-input NAND gate which sends the signal to the interrupt line of the computer (Flag 1) whenever an input occurs.

This can be tested for by checking the interrupt register to see if the FLAG interrupt bit has been set (bit 4 of 56589). If you don't intend to use this line then the IC can just be left out of the circuit; it will not affect the working of the rest of the board in any way. ICs 5-8 are for the 'continuous signal hold' circuit which is activated by the DIL switches (SW1-4).

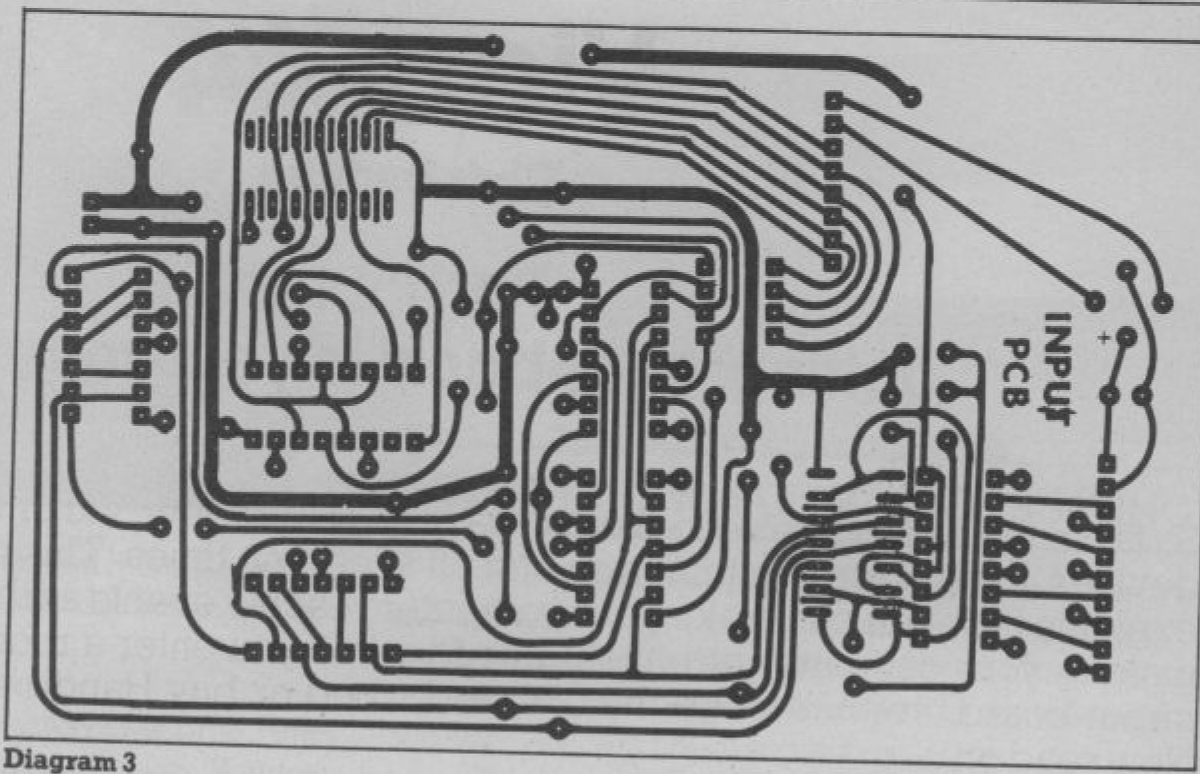


Diagram 3

Building your own PCBs

Before we start, let's look at components and PCBs. The fact is that the resistors and capacitors used are not critical. You can get resistors from Maplin but both 0.4W metal film, and 0.5W carbon film are suitable. Capacitors are disc ceramics unless otherwise stated; the Maplin miniature range being ideal.

As far as making PCBs is concerned, Maplin supply a range of PCB making materials. I use the rub-down transfers rather than a pen, since I find that this gives a more professional look and enables tracks to be put closer together when necessary. Anyone making a PCB for the first time is advised to make a simple board first before attempting a more complicated design. Anyone but the DIY enthusiast can happily skip this section.

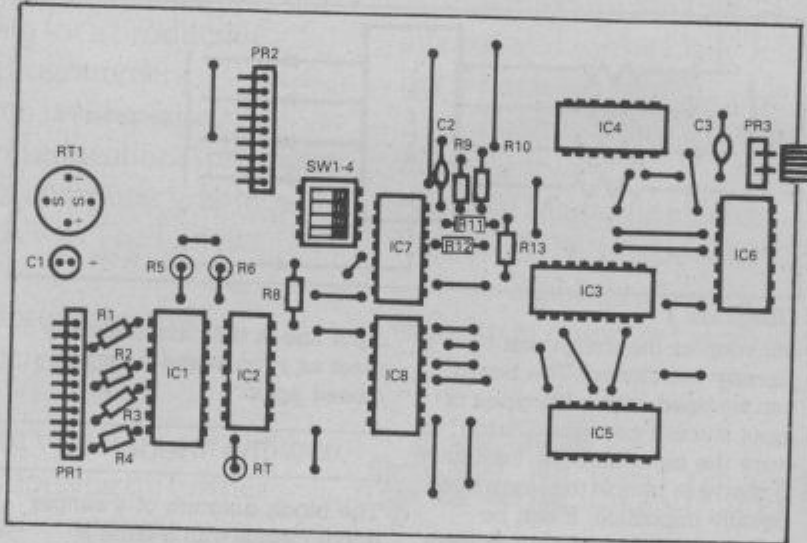


Diagram 4

Constructing your board

The PCB is a little complicated since there are a number of ICs fairly close together. This means that extra care must be taken to avoid any shorting out between tracks. Although it's not absolutely necessary to use sockets for the ICs, because they are CMOS devices I would recommend the slightly extra cost to avoid damaging them when soldering.

The order of construction is as follows: IC sockets, DIL switch, wire links, resistors and capacitors and finally the plug connectors; **diagram 4** shows the component layout on the board. When you're happy that all the connections have been made correctly, clean up the board and drill the mounting holes (If you are fitting it in the same box as the output board then it can be mounted on stand-off connectors on the lower board). The last thing to do is insert the ICs, ensuring that you are at earth potential before handling the devices.

Solder the socket connectors

continued on page 104

onto the wires as shown in **diagram 5a** and **5b**. The use of sockets and plugs for connecting wiring is recommended, to allow the board to be removed should this be necessary. It is not vital however, and wires may be soldered directly to the boards for a more permanent connection.

The prototype input board was fitted into the same box as the output board shown in Part two of the series. **Diagram 5c** shows the connections to the switches and phono sockets next to the computer reset switch. The two switches enable circuits 3 & 4 to use the 9v power supply from the computer instead of an external power source. In the 'off' position the input circuit must supply its own power, but when 'on' all you need is a wire with a switch (or similar on/off sensor) in circuit. The other two circuits must have a 6-12v power supply, since to run all four circuits off the 9v supply might overload it. The inputs are polarity conscious so you must ensure that the power supply is connected correctly (positive to the contact marked +).

Testing the board

Connect the board to the computer, then power up. If the computer does not power up as normal then switch off immediately and check the board for solder bridges or mistakes in the construction. Assuming all is well, type in the following short program and run it: (64 only – Vic details on request).

```
 5 POKE 56576, PEEK(56576)
   AND 247: REM SET SERIAL
   ATN LOW
10 POKE 56579, 15: POKE
   56577, 0
20 PRINT "‹CLR›"
30 X = PEEK (56577) AND 240:
   IF X = 0 THEN 30
40 PRINT"‹HOMR›"; X: POKE
   56576, PEEK(56576) OR 8
50 POKE 56576, PEEK(56576)
   AND 247: GOTO 30
```

When you generate an input, in the form of a voltage between the 0v connection and one of the input lines, then the computer should print a number on the screen. This will be 16, 32, 64 or 128 depending on which input is activated. Test each input in turn to ensure they all work correctly. The POKE in line 50 provides the 'reset' function to clear the latch after the input has been read.

Note that the SERIAL ATN line is being used to reset the latch. Since this is also used by devices on the serial port you must **POKE 56576, PEEK(56576) AND 247** after every serial port access (not forgetting to set the bit before accessing the serial port or you will get a DEVICE NOT PRESENT error). It follows that no inputs can be read while a device is accessing the serial port (printer or disk drive etc).

Making your system work

Like most of the projects the use is only limited by your imagination. **Diagram 6** shows a system, which automatically switches on the light when someone enters the room, then turns it off again when they leave. You will note that you need sensors (switches) which inform the computer that an action has occured which needs a response. The computer checks what the response should be, in this case turning the light on or off, and then sends a signal to the relevant output channel. The sensor in this case could be a double 'interrupted beam' switch which (with suitable decoding) could tell the difference between someone entering or leaving the room. The computer would need to keep a count of the total people in the room and only switch off the light when the last person left.

For this sort of application the DIL switches on the input board

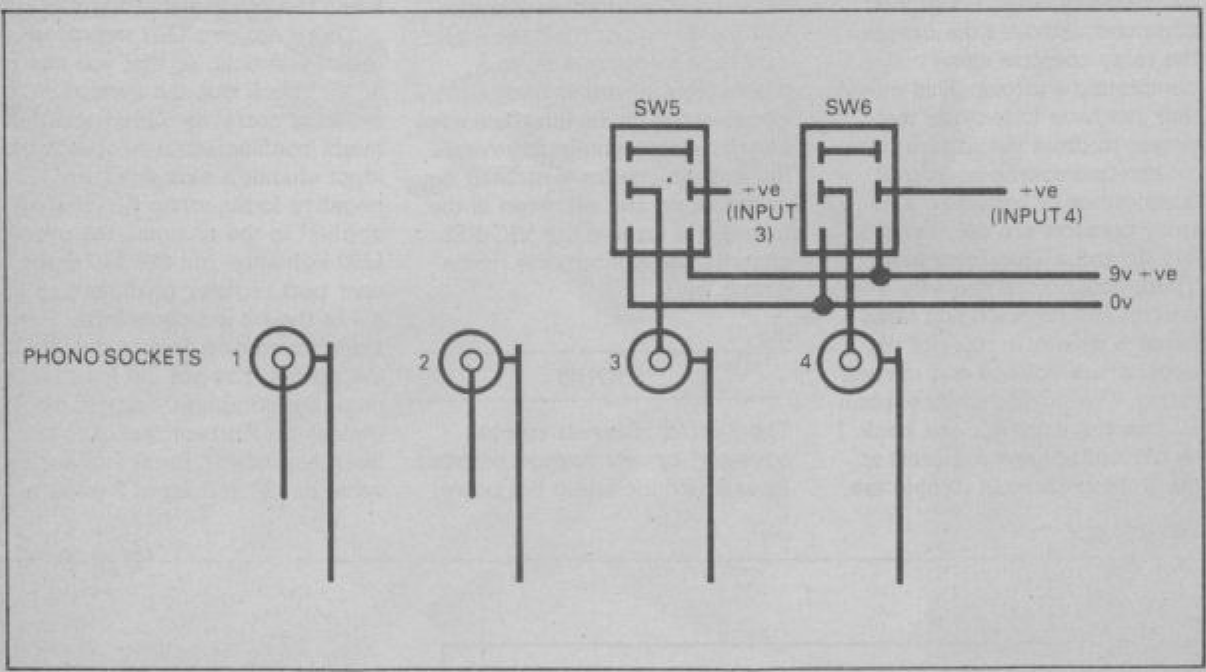


Diagram 5

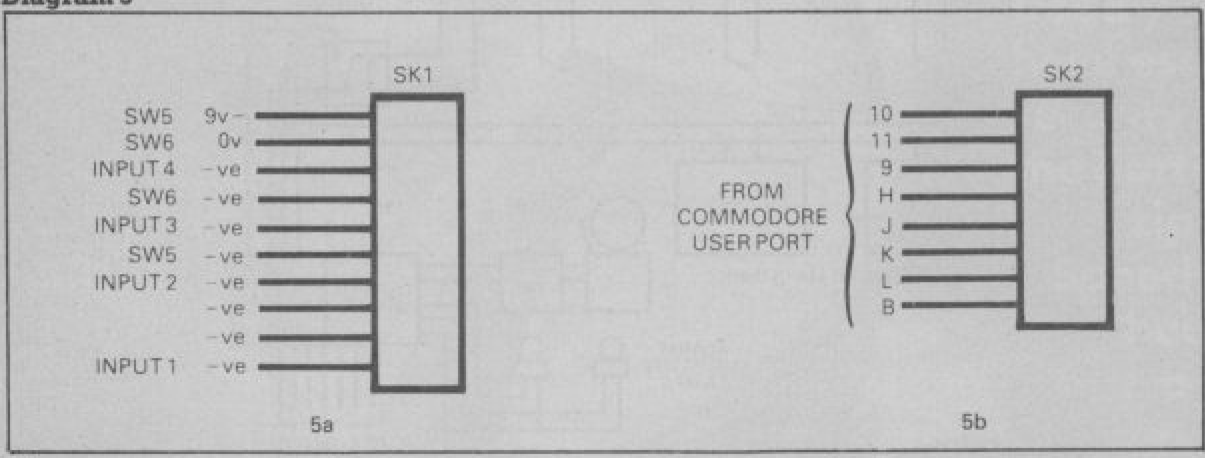
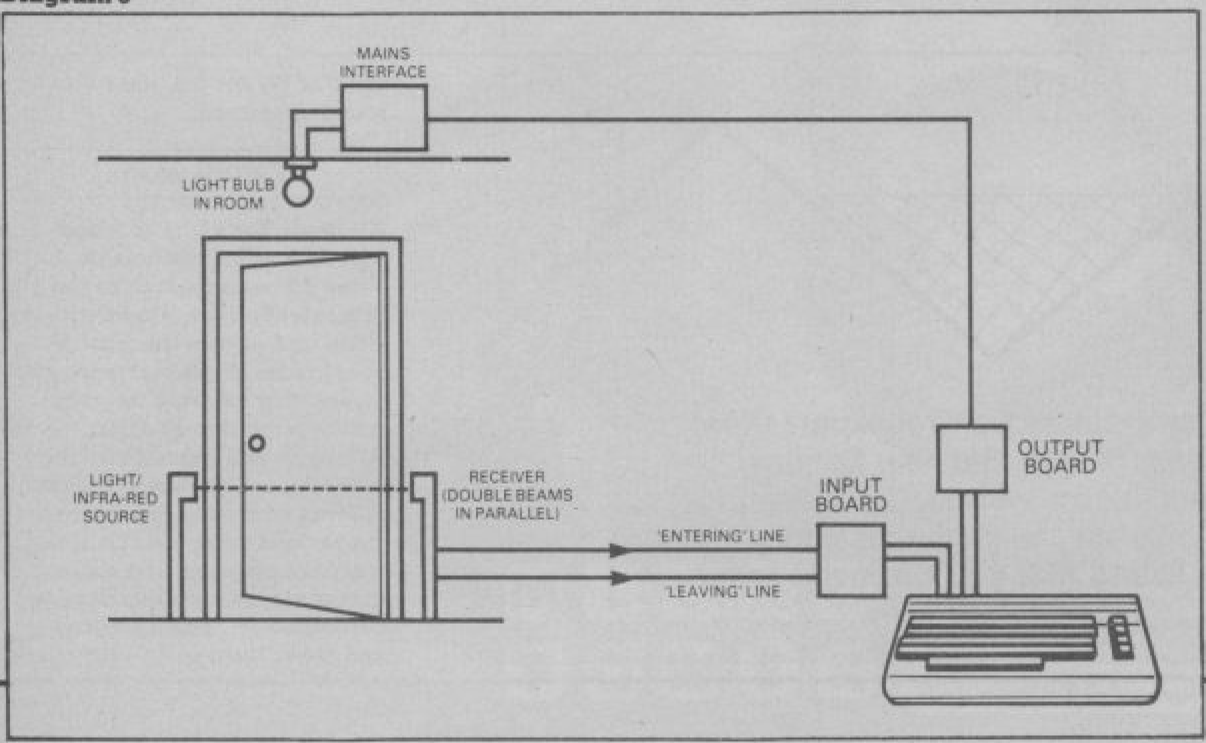


Diagram 6



would be set to the OFF position, since we have an occasional signal which must always be registered.

If you were using the computer as a burglar alarm, as shown in **diagram 7**, then you only want to know when the alarm is first triggered. In this case set the DIL switch for the channel to ON. Because the input channels are totally independent, you can have both types of input on the same board merely by setting the appropriate DIL switch.

If you've been following the series so far, you will now be able to build a 4 input, 8 output system to control or monitor many of the functions of your home, should you be so inclined. These devices can just as easily be used to operate a small robot, control a model railway – or just let your imagination run wild. It's this ability to make a decision, based on the program 'facts', that makes computer control so much more versatile than just a straight relay wired to a switch. There's no room here for a sample program, but one that acts as a burglar alarm and 'house manager' is available to you free from Commodore User on request.

VIC-REL – a commercial unit

For those of you without the facilities to construct boards, **VIC-REL** provides a simple and convenient way to interface the outside world to your computer, costing £34.95. Although not as sophisticated as the constructional projects it can be used to good effect in conjunction with the mains interface unit or for low-power control. The unit consists of a standard Vic-20 size cartridge with extra connectors on the front and back. The front connector plugs into the User Port on either the Vic or the 64, while the back connector is a strip of 20 screw terminals for connecting the wires. Included are a 5v power supply and a ground (0v) connection.

Outputs

The six output channels are just relay connections. When the computer activates the channel the relay contacts close completing a circuit. This means that you have to provide the power to drive the device from an external source such as a transformer or batteries. The relay contacts are only rated at 24v dc and a 250mA current. Therefore, before you can control any devices, you need either a triac or a relay of the appropriate voltage and current rating. The manual does explain all this, but does it at the back. I would rather have seen this at the front since most people are notorious for not reading the manual fully before 'having a go'.

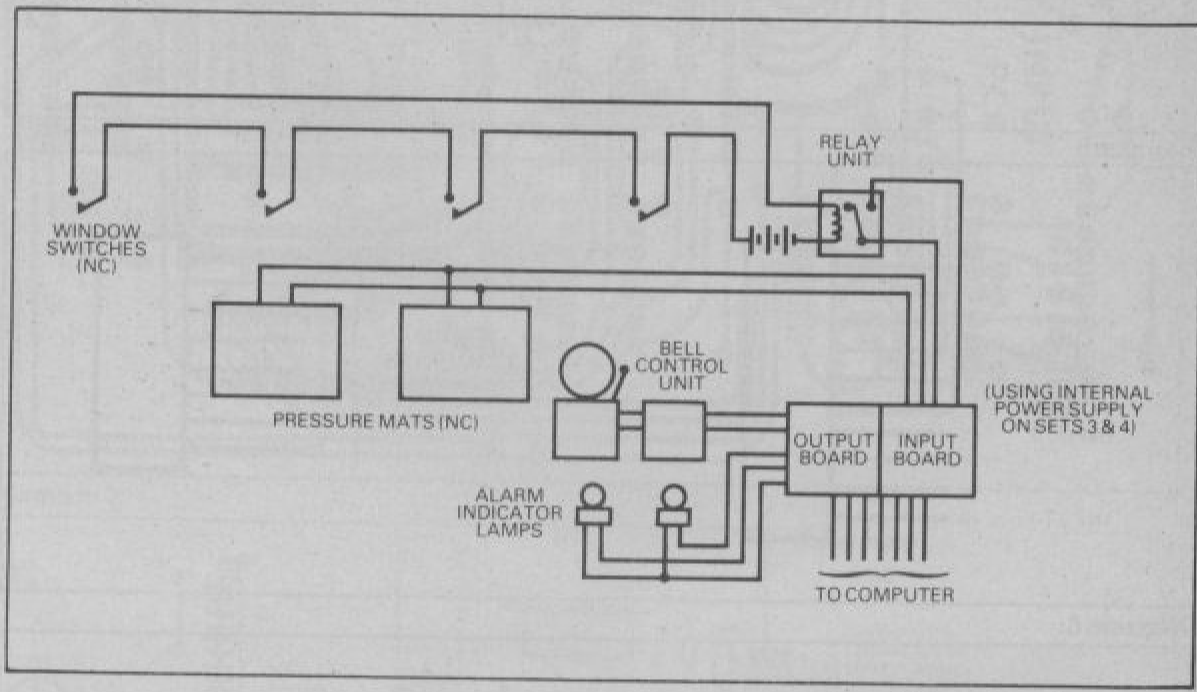
There are six red LED pilot lights which indicate when the relay contacts are closed on each of the channels. This is a useful indication that the computer is working correctly before you actually connect anything onto the relay. If you want to use VIC-REL to operate the mains interface described in Part one of the series (Commodore User, September issue) then you can use the 5v output from the cartridge to operate up to 5 triacs. Note however that because the mains interface uses negative logic you must reverse the instructions for switching the channels on and off given in the manual (ie turning the VIC-REL channel 'on' will turn the mains circuit 'off').

Inputs

The 2 input channels can be operated by any voltage between 5v and 12v; including the power output from the cartridge. Both channels are fully isolated from the computer so there is no danger of damaging the computer even if there is a fault on the input lines. The user port register is read with a PEEK command to see if either of the lines are set, but there is no latch; if a signal appears on the input briefly between two PEEKs then it will be ignored. The input channel must actually be 'on' when the computer reads it.

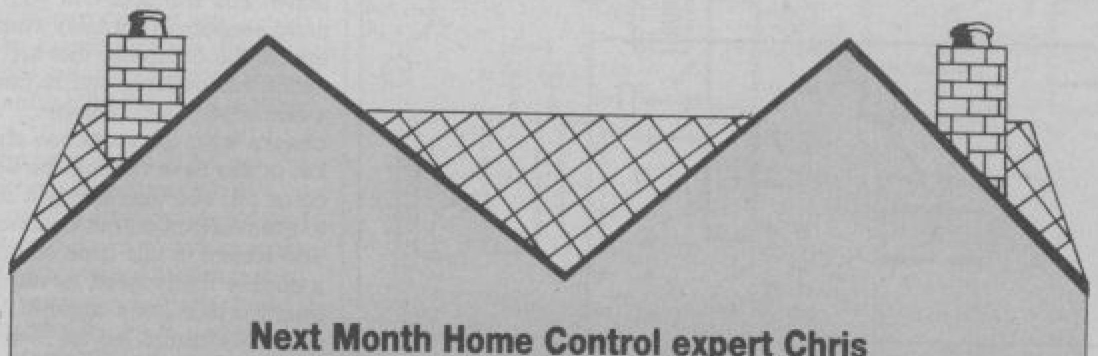
There are two LED indicators, green this time, so that you can again check that the system is working correctly. One point that might confuse some people is the input channels also work on negative logic; when 5-12v is applied to the channel, the green LED lights up, but the 'bit' in the user port register changes to a 0; a 1 in the bit indicates a no-signal condition. Unfortunately, the manual has got the input numbers completely mixed up (unless the current manual has been amended). Input 1 gives a value of 128 and input 2 gives a value of 64, not the other way round as printed.

Diagram 7



Conclusions

All in all, for £34.95 I found VIC-REL to be reasonable value for money. It does the job it is intended for, albeit without frills, and allows the non-constructor to play around with controlling external devices with a minimum of effort. Although you cannot control anything really useful without at least adding another power supply and some relays, it does whet the appetite and show that computers do not have to be limited to games playing and letter writing.





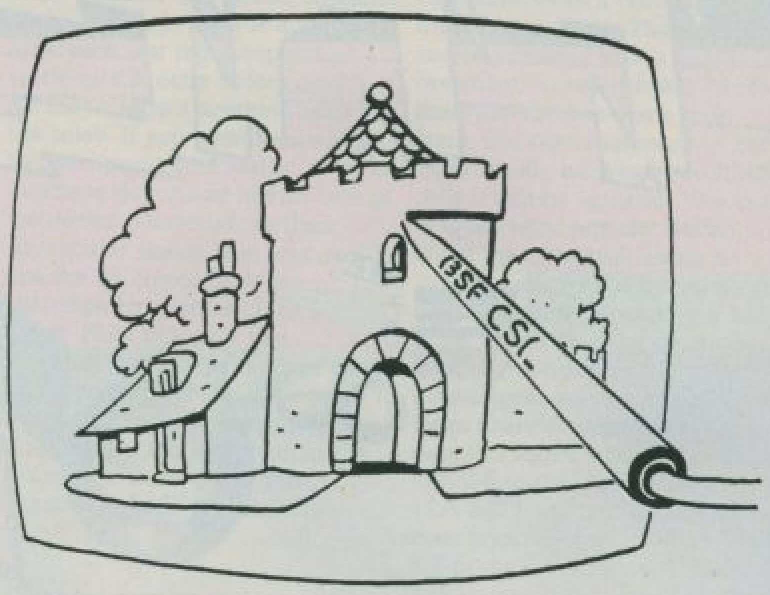
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Commodore's 1520 printer/ plotter reviewed

by Chris Durham

The 1520 printer/plotter has been around for a while, but it's still the only plotting device that you can link easily to your Vic or 64. And the price is cheap too. It's gone down from £170 to £99.99, making it more of a tempting proposition for your Christmas stocking. But can a machine that uses ball pens and 4ins wide paper be capable of doing anything really useful? Chris Durham finds out.

Once upon a time, deep in the dungeons of Commodore Towers, there was a lot of plotting going on. Lots of multi-coloured symbols appeared on long, narrow pieces of paper. No, this wasn't an early bid to oust the Chairman, but the Commodore boffins beavering away to produce yet another 'add-on' for their home computers. And so the 1520 was born, a combined printer and plotter, using four coloured ballpens (green, red, blue and black) mounted in a 'turret'. Commodore were not the first to produce such a device; others had beaten them to it for different machines, but Commodore saw the potential. For the first time, people buying a Vic or 64 could add on a device to give up to 80 column printing in colour, plus a drawing facility, at a price well below normal dot-matrix printers at the time.

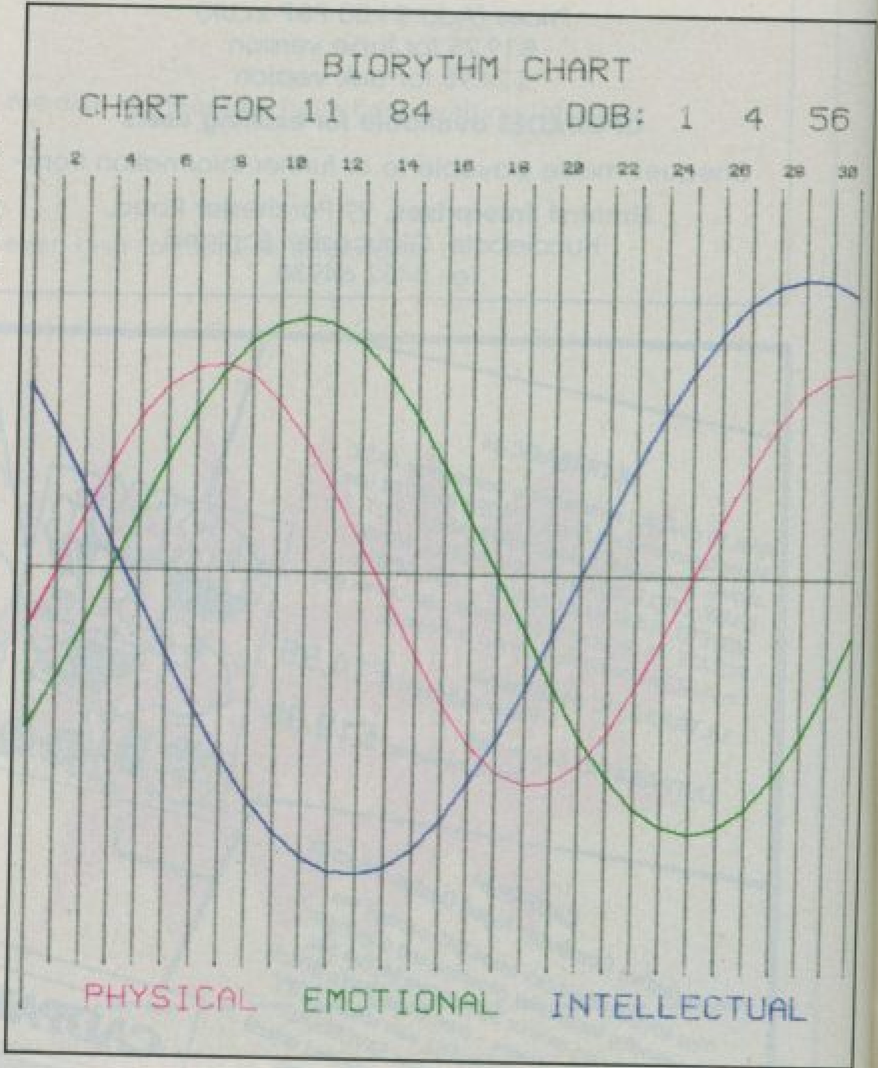
Why a plotter?

Until machines like the 1520 appeared on the market, plotters were large beasts used by major companies to produce maps, diagrams and such like. Some smaller A3 plotters were available for business or scientific micros to draw stuff like graphs and charts, but these were still rather expensive. Home computer users were denied any sort of plotting facility unless they could write their own routines for a screen dump on to a dot-matrix printer; and even then it was strictly black and white.

The breakthrough came with the sudden increase in computer ownership; at last there were enough people around who might just want a cheap machine that could draw lines and do printing, all in the same package. Suddenly, home computer users could draw graphs, plot equations, draw pretty pictures and generally do all the things they never even knew they had been missing.

1520 – the machine

The 1520 is a small machine measuring only 11ins wide by about 6ins deep, without the paper roll. This roll sits in the cradle at the back, rather like a life-boat between davits, and adds another 3ins to the depth. There is a removable cover on the top of the printer to allow access to the pen turret and to allow paper to be fed round the



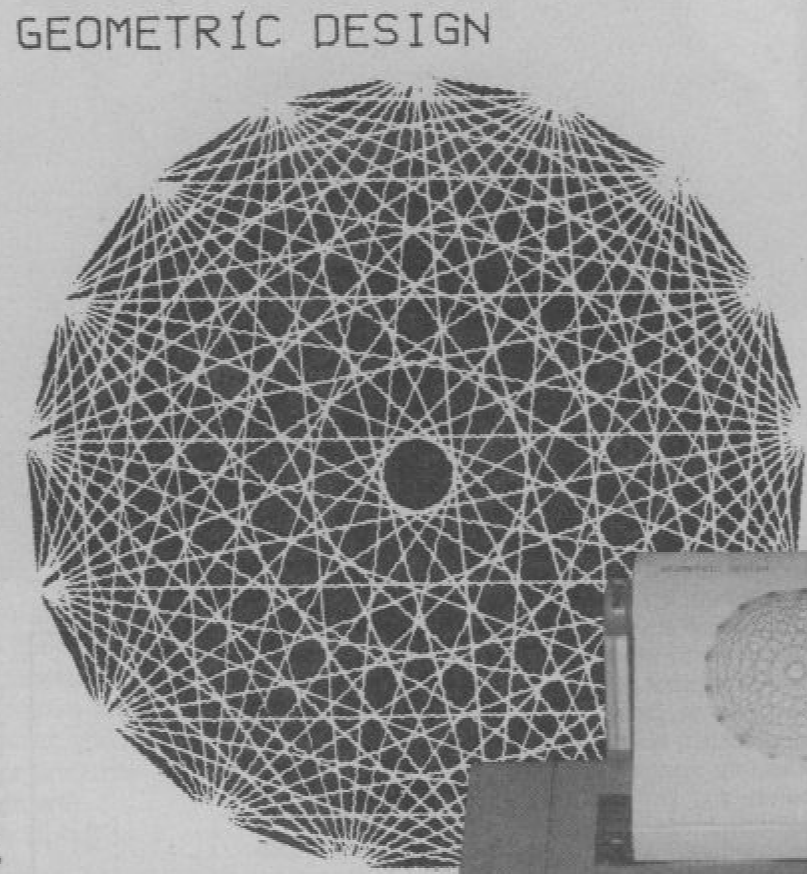
The great co

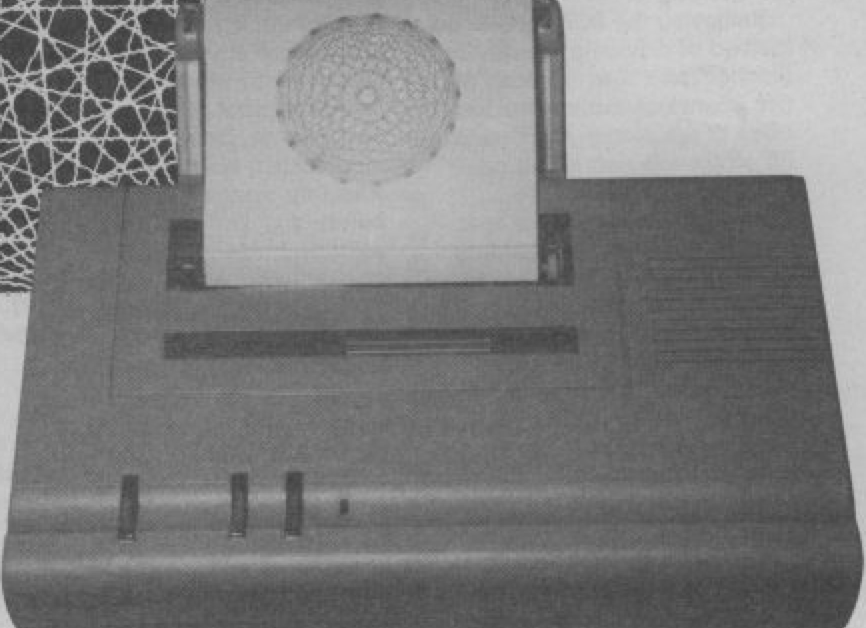
roller. The cover has a serrated 'tear-bar' included where the paper emerges, but while it does the job, the act of pulling the paper against it also tends to pull the paper through the rollers. The result, unless you are very careful, is a diagonal tear rather than a straight one – this is a minor niggle though, rather than a fault.

There are three controls on the front edge, plus the power-on indicator. The controls are (from the left) paper feed, colour change and pen change. The last of these allows you to insert and remove the pens from the turret, one pen at a time. When changing pens the turret moves to the extreme right-hand side of the carriage where there is a neat little bar that flicks the pen out of its holder. You then press the colour change button; the turret moves back to the left-hand side, changes the pen colour, then moves to the right for you to remove the next pen, and so on for all four – very neat, very clever.

It is recommended that you remove the pens and cap them when not in use; they are so small that they tend to dry out very quickly if left inside the plotter all the time. One complaint about the pens is the price; you have to buy a complete set of four pens at £5 a set, but it is often only the black pen that has run out of ink.

The internals of the machine are neat and well laid out. The print head and paper feed mechanism is all contained in the top-half of the case, connected by two sets of cables; one set connecting the switches to the PCB below. The power transformer is mounted inside the lower-half of the case on the right with a power switch and a 200mA fuse. On the left is the PCB which is uncluttered and well secured. There is a large heatsink between the PCB and the power unit and good ventilation; the machine did not get very hot even when left on for long periods.





The 1520 as a plotter

At the current price of under £100 you can't expect miracles. However, within certain limits the 1520 is capable of plotting almost any type of graph that can be expressed either mathematically or as a series of co-ordinate points. There are commands to move anywhere within the plot boundary relative to a fixed starting point, or relative to a temporary point (for example the last point plotted). The pen 'turret' moves along the X-axis and the paper is moved up and down in the Y-axis; both can occur simultaneously.

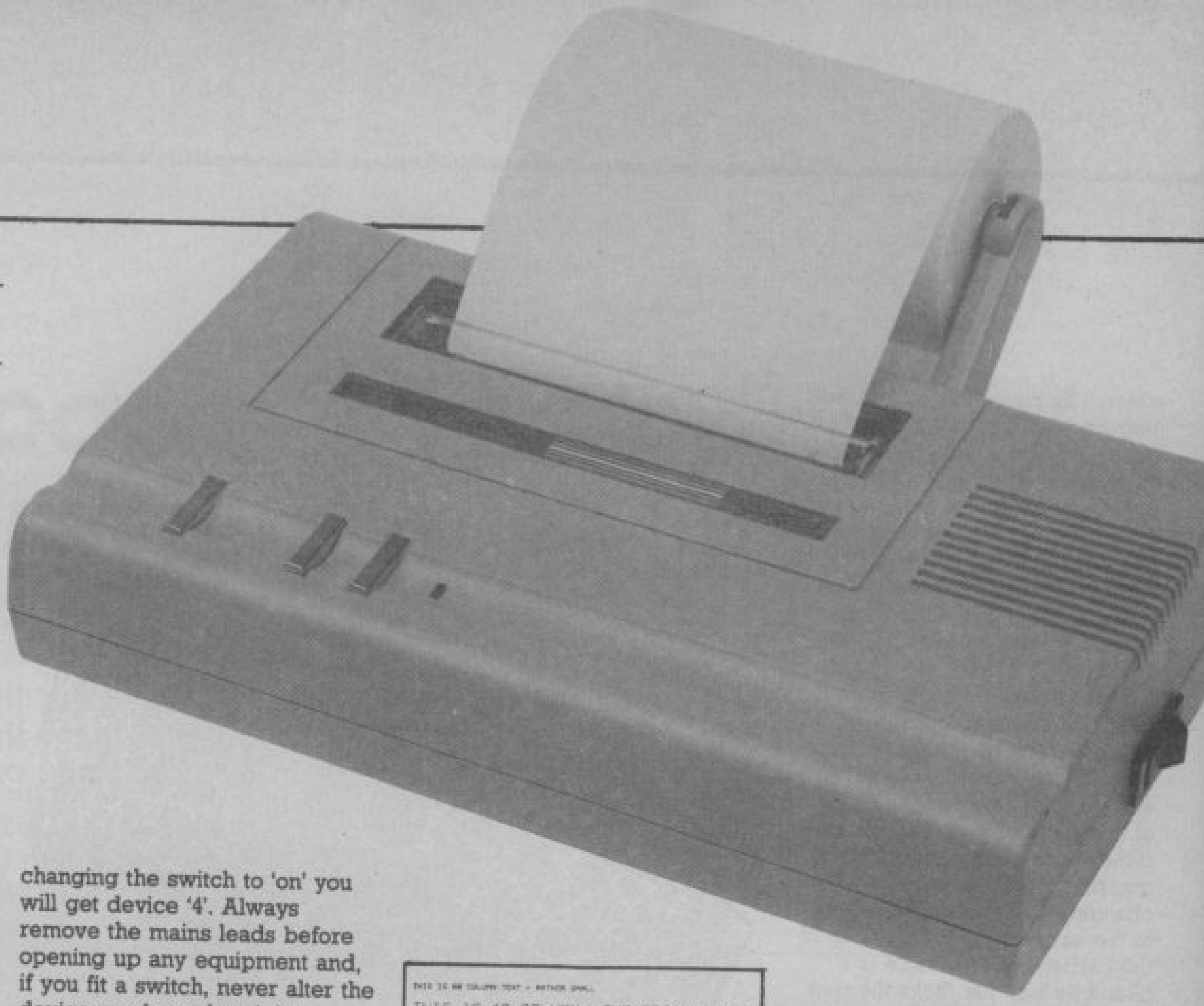
Colour is changed by rotating the turret so that the new pen is lined up at the same point as the old pen; the turret in fact moves off the plot to change pens and then moves back to the original position.

Because the paper is fed up and down by just two small pinch rollers pressing against the rubber platten, the paper can slip if there is any pull on it at all. The original 1520s had a cover over the paper, but this was later removed; I suspect because the paper would hit it and alter position when fed back. Even without this cover, you must be careful to ensure that the paper roll is partly slackened off to avoid any hint of tension.

I found that the first two or three plots were invariably ruined by paper slippage until the machine had warmed up. It is also advisable to 'roll up' as much paper as you are going to need for the plot and then rewind to the start point before you start the actual plotting. This must be done within the program since there is no manual 'backwards' feed on the machine.

Diagram 1 shows the type of plot that can be done: a example programs in the manual (which contained a major error as printed!). There are many similar designs which can be drawn very easily. You can even try out your own 'pattern maker' and experiment with the four different colours. You can plot dotted lines of varying ratios and even 'fill in' areas with colour, although since this must be done one line at a time it is rather laborious. Once you start using a plotter, you begin to find more and more uses for it as you become familiar with its capabilities.

omputer plot



Changing the device number

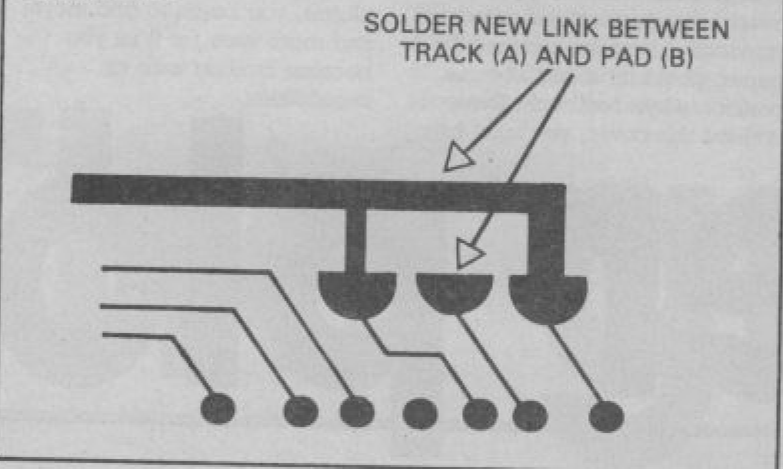
One of the most bemoaned *features* of the 1520 is that Commodore configured it as device '6', rather than the normal device number for printers which is '4'. The result is that there is a large amount of software which will not work with the 1520 as a printer.

Going for device 6 was supposed to allow both a normal printer and a plotter to be connected at the same time. However, Commodore do not fit a second serial port on any of their printers; unless you make your own splitter box there is no way you can connect two printing devices simultaneously! Fear not though, help is here.

Removing the PCB reveals the method of changing the device number from '6' to '4'. Undo the two screws on the bottom front edge of the plotter and carefully lift off the top part of the case, hingeing it backwards to disengage the lugs at the rear. Then undo the screws holding the PCB in place, including those holding the heatsink (do not undo the bolts connecting the components to the heatsink). Now turn the PCB over and find three half-moon shaped pads, as shown in **diagram 2**, just to the right of centre (holding the board so that you can read the printing at the top).

The two outer pads are connected and the centre one is not. To change the device number to '4', solder a short piece of wire from the centre pad to the track immediately above it (ie as the other two pads). If you wish to be able to change between device numbers easily then you can solder a wire to the track, a wire to the pad and connect both wires to a switch. With the switch 'off' you will have device '6', and by changing the switch to 'on' you will get device '4'. Always remove the mains leads before opening up any equipment and, if you fit a switch, never alter the device number when it is switched on. *Doing this modification will invalidate your warranty, so think carefully before you dive in with your soldering iron.*

DIAGRAM 2:



The 1520 as a printer

Having shown you how to reconfigure the 1520 as a standard printer, what sort of results are you likely to get with it? The first thing to say is that using ball pens is no substitute for a decent printer ribbon. Secondly, if you use the 80 column mode you shouldn't give the resulting printout to anyone with less than perfect vision; it's rather small. Lastly, you cannot obtain the Commodore graphics symbols from this machine; all you get is underlined alphabetic characters if you try. Having said all that, if all you want to do is list programs, make notes or write out recipes using a word-processor then the 1520 is perfectly adequate.

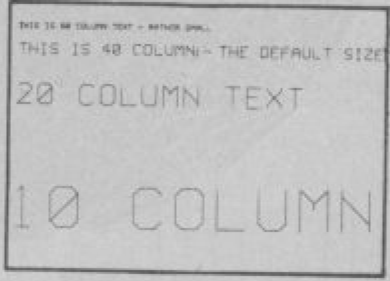


Diagram 3 shows the four different print sizes which can be used and these can be put to good effect when mixing text and diagrams. Text can also be rotated to the right by 90 degrees; by combining this with printing the characters in a different order you can orientate the text in a number of different ways. This is ideal for jobs like labelling the axes of graphs.

Providing you took care over the layout and subsequent printing it would be possible to print the output from a wordprocessor, leaving a suitable gap in the text, then go back and plot a graph in the gap, using a separate program. The one disadvantage is that most wordprocessors will be unable to change any of the parameters of the printer such as text size, because of the way this is done, unless they have been specifically written for use with the 1520.

The manual

Like all Commodore manuals, the manual is a mixture of good and bad. It is fairly logically laid out and there is a good Contents Table at the front which makes up for the lack of an index. There are examples of virtually all the facilities, which can be typed in to see how they work, although the section on plotting lines which talks about *absolute origin points* and *relative origin points* is a little confusing. The bad point is that some of the more complicated example programs at the rear of the manual contain errors which send the plotter all over the place. Line 220 in the Geometric Design on page 53 for example should read **L*COS** and not **L*SIN**. Silly errors like this should really be caught at the proof reading stage. Apart from the errors, though, it is a useful manual and provides plenty of examples to stimulate the imagination of the user.

Conclusions

The 1520 printer/plotter is a neat compact little machine which nicely fills in a hole in the market. As a printer alone it is rather limited except for personal use and there are other small printers about which give better quality at around the same price.

However, if you have any need at all for a plotting facility then I regard this as good value at under £100. It is a fun machine and if you like the idea of the new MCS 801 colour printer from Commodore, but can't afford £400 then the 1520 is a consolation prize to do similar things in miniature.

● For those who already have a 1520, Chris Durham has produced a program to let you plot your Biorhythms – it's in the Victuals section of this issue.

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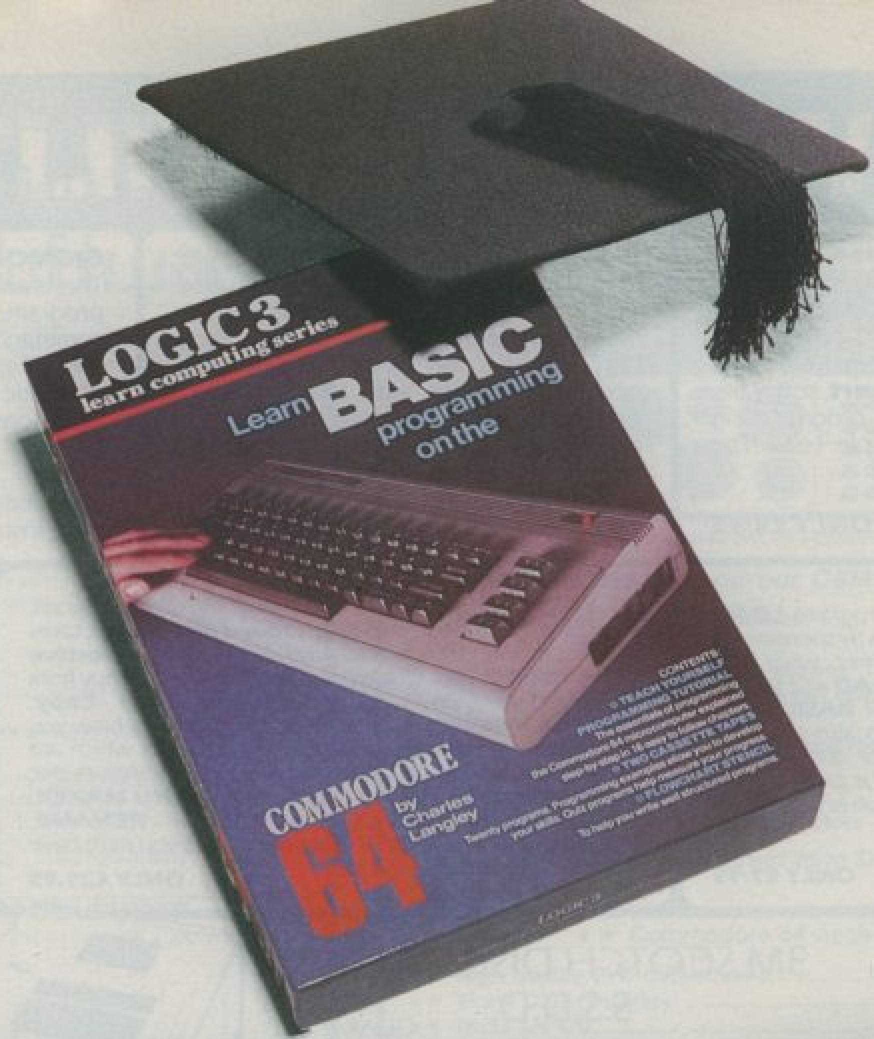
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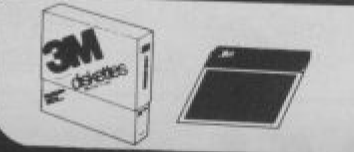
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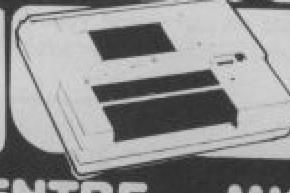
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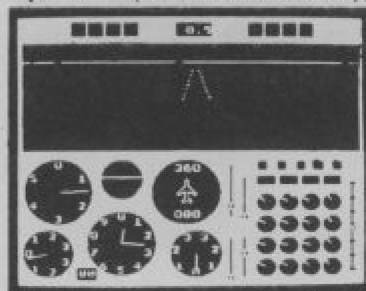
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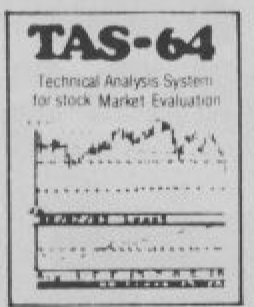
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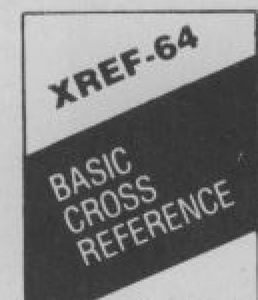


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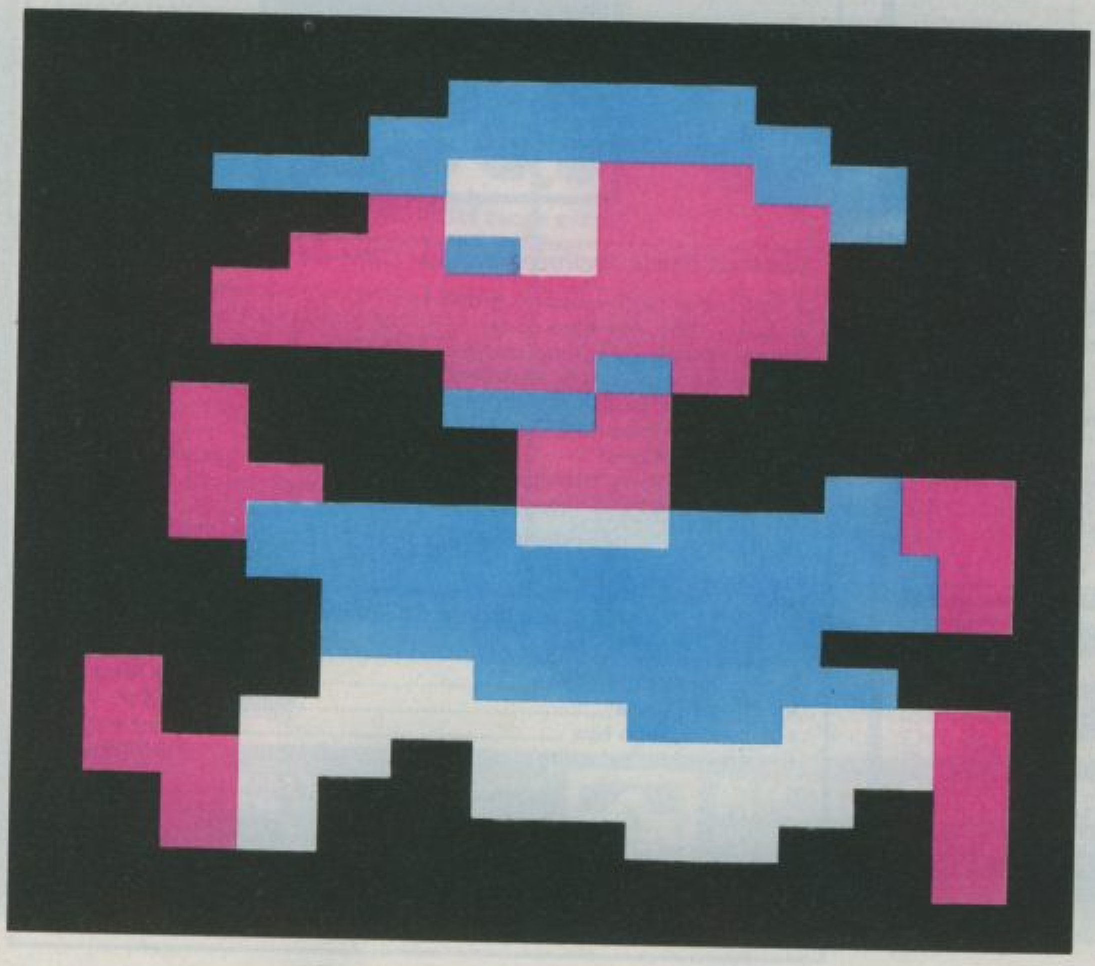
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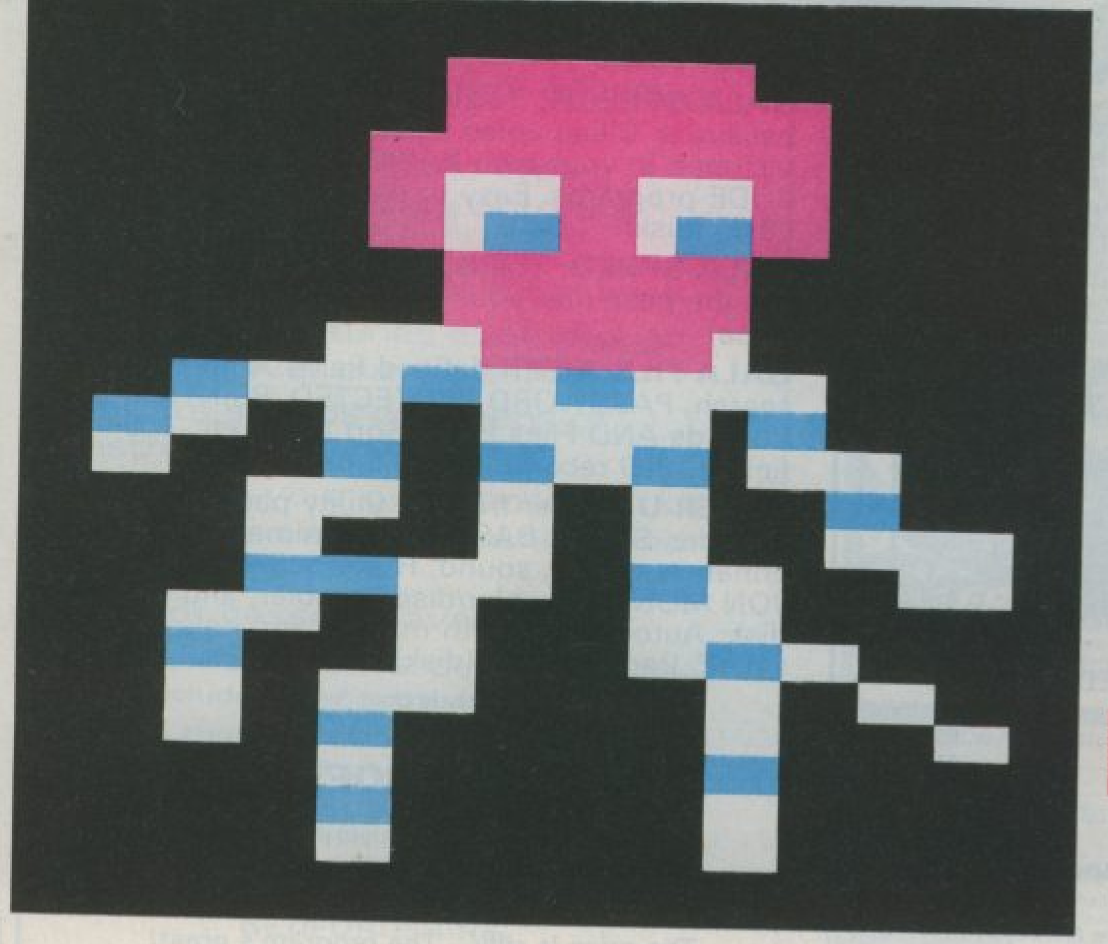
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To start with, just type in the program from Table 1; note that some lines don't apply to both machines. On the 64 it's a good idea to SAVE before you RUN the program – one typing error can crash the computer and that means back to the beginning.

The next step is to RUN the program. With the 64 things will happen before your very eyes; with the Vic nothing appears to happen, but in fact the computer is hard at it – PEEKing and POKEing from ROM to RAM. More of that later. In the meantime, just sit tight. After a while you'll see READY and the cursor, or an apology for it, will appear. Type away: and the computer seems to operate exactly as it did before. And so it does until you try some reversed characters. RVS '@, 'A' and 'B' will produce the three characters in Table 3 (other reversed characters will produce garbage).

There's the basis for a program with your own characters. But a lot of memory has been used – no problem with the 64, but on the Vic there's only about 800 bytes left for your program (and just under 3900 with the Super Expander fitted) Not a Lot, as Mr. Daniels would say, but enough!

What if you want different characters to those in the table? Or say you want to save memory by copying only some of the 'switch-on' characters? Or your program calls for reversed characters, or upper and lower case letters? Read on: all is about to be revealed.

How do you choose the 'switch-on' characters you want?

First the bad news. As we are going to define some characters, we must define them *all* – at least all the ones we want. That includes standard alphanumerics and your own brand new characters.

Now the good news. It is easy to pick and choose the characters to be defined. We can look (PEEK) into ROM, where the computer keeps copies of its standard characters; and from there we can copy them (POKE) into RAM. This is what line 120 does.

With nearly 10K still available, 64 users can relax: but VICtims will want to copy as little as possible. All that follows applies equally to both computers, however.

There are four sets of 128 characters stored in the computer's ROM: see Table 2. These are Set 1, the Upper Case and Graphics Set, in normal and reversed forms: and Set 2, the 'Text' Set (upper and lower case letters plus some graphics) – again in normal and reversed form (that's the set you get if you press SHIFT and the Commodore key.

Where you PEEK in Line 120 will decide which of the four sets are copied. The starting numbers for PEEK are:

	Vic-20	C 64
Set 1: normal:	32768	53248
Set 1: reversed:	33792	54272
Set 2: normal:	34816	55296
Set 2: reversed:	35840	56320

In the Starter Program, Line 120 has the PEEK set to copy Set 1; but by changing the PEEK number any one of the other three sets can be copied instead.

Line 110 selects which characters from the set are to be copied. For example, try **FOR I= 8 TO 215**. That simply selects the upper case letters from Set 1 of the lower case letters from Set 2, depending on the PEEK number in Line 120.

Programs usually need at least some of the standard characters, so you'll copy those. Just pick and choose to use the minimum amount of precious memory. Perhaps a program might need upper and lower case letters, numbers and some punctuation. The first part of Set 2 (PEEK 34816 or 55296 accordingly) has all this. So you could use this:

```
110  FOR I = 8 TO 727
120  POKE 5120 + I, PEEK(set
     + I): NEXT
```

... where *set* is 34816 for Vic or 55296 for 64.

Or, meaner still, miss out some unwanted characters, those your programs aren't likely to need – those with POKE numbers from 33 to 43, say. Line 110 becomes **FOR I = 8 TO 263**. Line 120 is unaltered.

We also need to redefine some of the standard characters into your new shapes, so now we need two more lines for the second group of characters to be copied, so add:

122 FOR I = 352 TO 727

Line 124 is exactly the same as Line 120, so put the Cursor over line 120, change 120 to 124 and RETURN.

Table 1: A Starter Program

	Vic-20	Commodore 64
	To set the computer up:	
100	POKE 51,255: POKE 52,19 POKE 55,255: POKE 56,19	POKE 53272, (PEEK(53272) AND 240) +12: POKE 52,48: POKE 56,48:CLR
105		POKE 56334, PEEK(56334) AND 254: POKE1, PEEK(1) AND 251
	To copy the text characters out of ROM into RAM:	
110	FOR I = 0 TO 1023	FOR I = 0 TO 1023
120	POKE 5120+I, PEEK(32768+I): NEXT	POKE 12288+I, PEEK(53248+I): NEXT
125		POKE 1, PEEK(1) OR 4: POKE 56334, PEEK(56334) OR 1
	To put the defined characters into RAM:	
130	FOR J = 0 TO 23: READ A	FOR J = 0 TO 23: READ A
140	POKE 6144+J, A: NEXT	POKE 13312+J, A: NEXT
145	POKE 36869, 23	
	The last three lines are the same for both computers:	
150	DATA 24,60,60,24,255,255,66,66	
160	DATA 60,60,24,60,126,255,66,195	
170	DATA 0,16,248,28,31,28,248,16	

Being too fussy can mean the extra lines needed use up more memory than that taken by the characters left out. Please yourself: the possibilities are endless. Table 2 has the start and finish numbers for each character – in line 122 you go FOR the 'From' number of the first character in the group to be copied TO the 'To' number of the last character in the group.

Now to define our own characters

This is simple. Table 3 gives three examples. Each character is designed on an 8 x 8 grid

Line 110
I Values

Line 110
I Values

To set the computer up:

To copy the text characters out of ROM into RAM:

To put the defined characters into RAM:

The last lines are the same for both computers:

(square) of squares. Simply shade in squares on the grid until the character you want is obtained – an eraser is a must! (All the 'switch-on' characters on the computer were designed in this way; this can be seen quite clearly by a close look at a large-screen Vic.)

Once the required shape is found, all that is needed is a simple addition for each line on the grid; it's just a binary-to-decimal conversion. The sums for the characters on Table 3 are shown on Table 3. The answer to that sum is the DATA value for that line to go in lines 150-170 – compare the underlined values on Table 3 with the DATA values in lines 150-170.

For clarity, the sample program has a separate line of DATA for each character. That's recommended: but the DATA items can follow on, on the same line until the line is full. There *must* be eight DATA values for each and every character to be designed.

Line 130 will be **FOR J = 0 TO X**, where X is less than eight times the number of characters being defined – hence 23 in the Starter Program, for three characters.

How do we 'work' our character?

Each defined character must be assigned to a particular key – any key we choose – on the computer. This is done in Line 140.

As it stands, Line 140 puts the three characters into reversed '@','A' and 'B'. That means if you type RVS '@' or POKE 129 into a location, New Character 1 will appear on the screen. Similarly RVS 'A' and POKE 130, or RVS 'B' and POKE 131, will produce respectively the second and third characters.

It is not always convenient to use reversed characters in a program. Fortunately there are alternatives. For example, we can put the characters into strings. A line to do this might be:

180 A$ = "[RVS ON] @ [RVS OFF]": B$ = "[RVS ON] A [RVS OFF]": C$ = "[RVS ON] B [RVS OFF]"

This is not a lot better. An alternative is to assign them to keys whose characters have not been copied. If they have in fact been copied, our defined characters will 'win'; it will replace the character previously copied from ROM.

It is helpful to assign them to keys which follow each other in the POKE list, Table 2, and which are next to each other on the keyboard. The four graphics character keys at the end of the POKE list fit the bill – the ones you get when you hold the Commodore and SHIFT keys while pressing C, X, V and B. POKE 124, 125, 126 and 127 respectively are the numbers you need.

Unfortunately the 'C' and 'X' are the 'wrong way round'; but we can put up with this. If we choose to put our three characters on to CBM/SHIFT 'C', 'X' and 'V', we must change line 140:

140 POKE *char* + J,A: NEXT

... where *char* is 6112 for the Vic or 13280 for the 64 – 6112 is 5120 + 992; 13280 is 12288 + 992. 992 is the starting or 'From' number of the character at 124, CBM/SHIFT 'C' – the first of our three 'new' keys. This puts our three

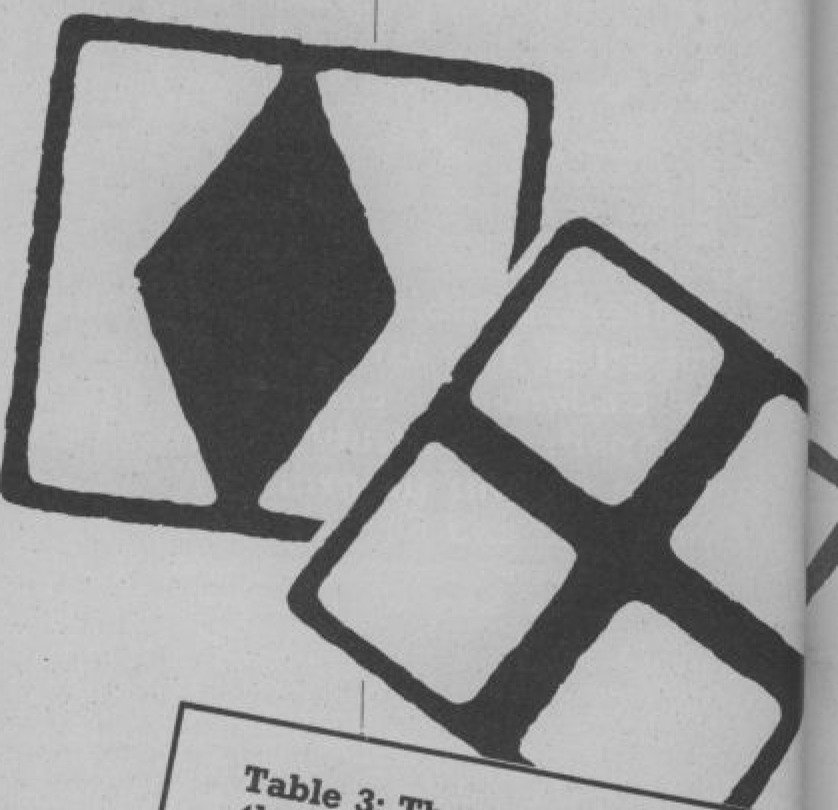
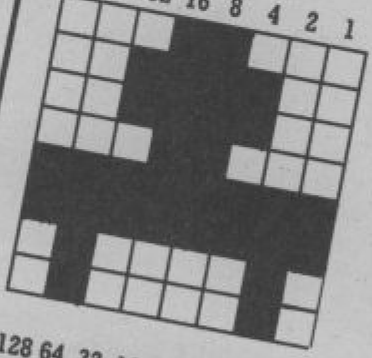
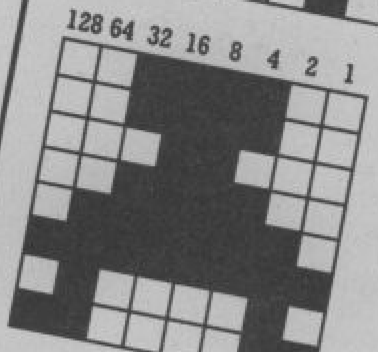


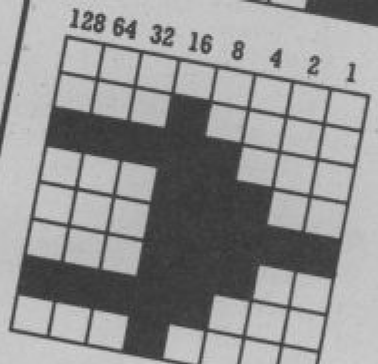
Table 3: Three user-defined cha[...] the DATA they need for Lines 1[...] Table 1



16+8=24
32+16+8+4=60
32+16+8+4=60
16+8=24
128+64+32+16+8+4+...=25
128+64+32+16+8+4+...25
64+2=66
64+2=66



32+16+8+4=60
32+16+8+4=60
16+8=24
32+16+8+4=60
64+32+16+8+4+2=126
128+64+32+16+8+4+2+1=...
64+2=66
128+64+2+1=195



0
16=16
128+64+32+16+8=248
16+8+4=28
16+8+4+2+1=31
16+8+4=28
128+64+32+16+8=248
16=16

defined characters into the same part of RAM as our copied characters; and it dispenses with the need strings and RVS characters.

And now it's up to you

The characters are defined and copied. The time has come actually to write a program. Use the copied and defined characters as you wish; there are no limits, except for memory.

Once the characters are designed and their keys chosen, it is well worthwhile to write the main program first; that saves hours of time for the computer to PEEK and POKE every time the program is RUN.

It will look a bit odd if your Eekon or whatever is a black quarter square in one corner when programming; but provided you can remember what it's *going* to be when you RUN, so what?

Then you can use a GOSUB or GOTO or merge in some previously saved lines to add the copying, defining and assigning lines as the finishing touch.

Whatever else you do, though, 64 users should SAVE the program *before* you RUN the 'character' parts: else all those hours of typing might turn out to have been in vain!

The program works with the unexpanded Vic or with a Super Expander or 3K cartridge added. It will *not* work with 8 and/or 16K expansion and we have yet to find the secret for this. *Mastering the Vic* tells us to raise the bottom of memory above the character matrix! Not only do we not know how to, we don't know what it means. Surely someone, somewhere, knows: please tell.

Acknowledgement

There is barely an original thought in all this. It has been drawn from a variety of books and manuals as well as a host of magazine articles and tips. To Hampshire, Tommy, Todd, Butterfield and all the rest of you who are thinking, "I bet they got that from my ...", we in turn would simply say, "We expect you're right. Our grateful thanks!"

Happy programming. It works; we have no idea why, but it works!

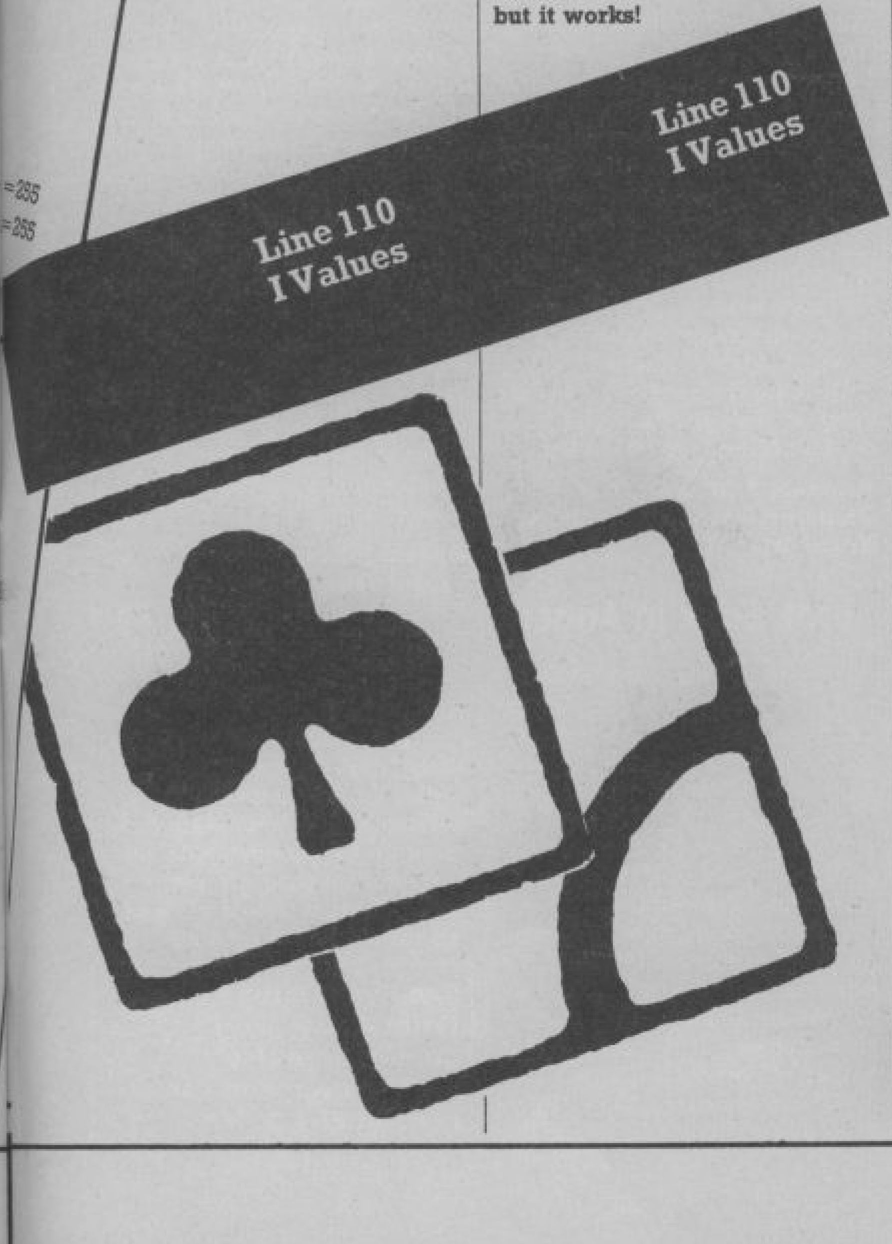


Table 2: Address values to copy 'switch-on' characters from ROM to RAM

Line 110 I Values

SET 1	SET 2	POKE	From	To
@		0	0	7
A	a	1	8	15
B	b	2	16	23
C	c	3	24	31
D	d	4	32	39
E	e	5	40	47
F	f	6	48	55
G	g	7	56	63
H	h	8	64	71
I	i	9	72	79
J	j	10	80	87
K	k	11	88	95
L	l	12	96	103
M	m	13	104	111
N	n	14	112	119
O	o	15	120	127
P	p	16	128	135
Q	q	17	136	143
R	r	18	144	151
S	s	19	152	159
T	t	20	160	167
U	u	21	168	175
V	v	22	176	183
W	w	23	184	191
X	x	24	192	199
Y	y	25	200	207
Z	z	26	208	215
[		27	216	223
£		28	224	231
]		29	232	239
↑		30	240	247
←		31	248	255
		32	256	263
!		33	264	271
"		34	272	279
#		35	280	287
◁		36	288	295
△		37	296	303
◆		38	304	311
↑		39	312	319
(		40	320	327
)		41	328	335
◊		42	338	343
+		43	344	351
,		44	352	359
–		45	360	367
.		46	368	375
/		47	376	383
0		48	384	391
1		49	392	399
2		50	400	407
3		51	408	415
4		52	416	423
5		53	424	431
6		54	432	439
7		55	440	447
8		56	448	455
9		57	456	463
:		58	464	471
;		59	472	479
<		60	480	487
=		61	488	495
>		62	496	503
?		63	504	511

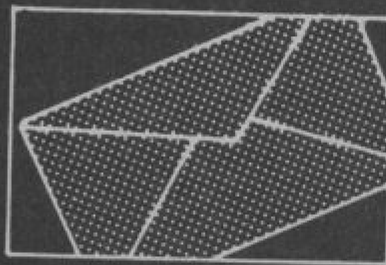
Line 110 I Values

SET 1	SET 2	POKE	From	To
		64	512	519
	A	65	520	527
	B	66	528	535
	C	67	536	543
	D	68	544	551
	E	69	552	559
	F	70	560	567
	G	71	568	575
	H	72	576	583
	I	73	584	591
	J	74	592	599
	K	75	600	607
	L	76	608	615
	M	77	616	623
	N	78	624	631
	O	79	632	639
	P	80	640	647
	Q	81	648	656
	R	82	656	663
	S	83	664	671
	T	84	672	679
	U	85	680	687
	V	86	688	695
	W	87	696	703
	X	88	704	711
	Y	89	712	719
	Z	90	720	727
		91	728	735
		92	736	743
		93	744	751
		94	752	759
		95	760	767
SPACE		96	768	775
		97	776	783
		98	784	791
		99	792	799
		100	800	807
		101	808	815
		102	816	823
		103	824	831
		104	832	839
		105	840	847
		106	848	855
		107	856	863
		108	864	871
		109	872	879
		110	880	887
		111	888	895
		112	896	903
		113	904	911
		114	912	919
		115	920	927
		116	928	935
		117	936	943
		118	944	951
		119	952	959
		120	960	967
		121	968	975
		122	976	983
		123	984	991
		124	992	999
		125	1000	1007
		126	1008	1015
		127	1016	1023

Letters

Write away

This is your page: normally we write for you, but here we listen. Feel free to let us know what you think – about the magazine, about Commodore, about suppliers, about life, art, the meaning of existence or whatever. We don't print everything we receive, of course; but anything that might be of specific relevance or general interest will make it to these pages.



Colour change

I'm glad to see you have initiated a regular adventure column: this makes your already excellent magazine even better.

In the October adventure column you complained about the shortcoming of some text adventures having blue text on blue background, and mentioned the Infocom titles as major offenders. Of course, it isn't possible to incorporate your Basic colour-change subroutine in Infocom adventures: nevertheless, producing a better colour combination for these adventures is a simple procedure. Before loading, type:

POKE 53280,X
POKE 53281,X
POKE 646,Y.

Where X is the code for your desired background colour, and Y is the code for your character colour: my own preference is for yellow text (Y-7) on a black background (X-0), although black on yellow is good as well.

You can follow a similar procedure to alter the screen appearance of Level 9 adventures, but can only alter the background colour. Still, light blue on black is much better than blue on blue. Keep up the good work.

Paul Fairbairn, 40 Kingsleigh Road, Heaton Mersey, Stockport SK4 3PP.

Wearing Ribbons

Dear Sir, In your October issue you published a letter from R G Holmes saying that, in view of the cost (£6.65) of buying a new ribbon for his 1515 CBM printer, he was interested to read that the MPS-801 printer has an eaasily replaced inker.

Do not be too jealous of us MPS-801 owners Mr Homes; although, in theory, the inker is easily replaced in the ribbon cassette, there are none available (at least in this part of England)! All the shops I have tried tell me the same story, that they have had inkers on order from Commodore since the Printer went on sale but they cannot get any delivered. Strangely enough there are plenty of cassettes complete with inker available at a cost of £9.95, although why Commodore should expect 801 cassettes to require replacement before they run out of ink is a mystery to me.

Like Mr Holmes I have devised my own low-cost solution to the problem rather than be conned into buying a new cassette each time the ink runs out. It only takes a few minutes and costs a few pence to refill an inker using my method. Here it is, for others who have the same trouble:

i) Buy two cheap ball-point pens costing a few pence each and remove the ink-tubes from the cases.
ii) Drill a small hole in the end of the inker remote from the inkpad.
iii) Insert the open end of one of the ink tubes into the hole and squeeze the ink into the inker by sliding a pair of pliers or tweezers down the tube.
iv) Repeat (iii) with the other ink tube.
v) Reseal the inker using bluetack or any other suitable sealant.

If the ink-pad has become very dry, it may take a few lines before the ink works through the pad on to the ribbon and thence to the paper; the process can be speeded up by adding a drop or two (no more) of methylated spirits to the ink before resealing the inker.

Take care when handling the ink tubes and the inker as the ink will mark most surfaces (even hard plastics) and it is difficult to remove. If you do get ink where you don't want it, do not try to remove it with water; wipe up with a rag or paper towel soaked in "Dirty Paws" or "Swarfega".

D.I. Dalgleish, 56 Selborne Road, Southgate, London N14 7DH.

D Dalgleish points out that his letter was printed using the above method, and it looked just fine. But be warned: printer manufacturers claim that ribbons are impregnated with special ink and that re-inking them may cause the tiny needles in your print head to become blocked.

The Other Side

Scarcely a month goes by without someone rediscovering that if you cut a second write notch in a floppy case, you can turn it over and use it. Most editors point out that single sided disks have failed the production test on one side and therefore there is a risk. But there is really a far more serious danger than this.

If you turn a disk over in a single sided disk unit it gets rotated in the opposite direction inside its cover. This means that while you are using the 'flip' side, dust and debris which has been carefully swept up and retained by the fibres on the inside of the case, are now not only shaken out on to the 'A' side again, but because of the 'lay' of the fibre pile, are actually in a situation where they may be forced into the sensitive surface. You may get away with it, but you run the chance of wrecking the first side.

Double sided disks are only rotated in one direction and have read/write heads on both sides.

Reginald A Mascall, The Chilterns, Newton, Thornbury, Bristol BS12 1LF.

Look Back in Anger

I would like to make the following points regarding your review of our Flight Simulator which appeared in the October issue, and in particular answer criticisms by Chris Durham.

The purpose of the grid in this program is to indicate the relative screen positions of the aircraft and airports for subsequent use when running the program. However, the significance of this grid is merely diagramatical and does not affect your operation of the program. For further reference see page 63 of the Commodore User Guide. However, there is no need to use the grid at all if you call up the map during play and head your aircraft in the direction of whichever airport you choose.

With regard to the two 'bugs' Chris Durham experienced, may we deal with the problem of the undercarriage first. The program was written in the manner that the undercarriage takes two seconds to operate satisfactorily and if the key is depressed twice, or the joystick not centred, the undercarriage will indeed go up and down in different parts of the program. Therefore, please make sure that the 'G' key is pressed once and left to do its work in due course.

We feel that in his excitement to land the aircraft, Mr Durham fell into the obvious trap of flying too low, too slow. The program is written to make the aircraft nosedive under these conditions and a further attempt to land is then necessary. In order to avoid the nosedive and attempt a second landing, it is possible to retrieve the situation by immediately applying maximum power with the joystick in the climb position. May we suggest that he tries landing again this time keeping speed over 300 knots until requested by the prompt screen to reduce speed.

Finally, may we add that the plane is not easy to land, but of course it can be done. We felt that if we made it any easier, it would detract from the enjoyment of the game.

Angela Johnson, Anger Productions, 14 The Oval, Broxbourne, Hertfordshire EN10 60Q. Tel: Hoddesdon [0992] 461156.

Angela Johnson also informs us that Chris Durham reviewed an early Mark I copy of Flight Simulator. The latest Mark 3 version has an improved view through the window, with the horizon changing when you bank. There is also a view of the runway upon landing.

Send your letters to: Write Away, Commodore User, 30/32 Farringdon Lane, London EC1 3AU.

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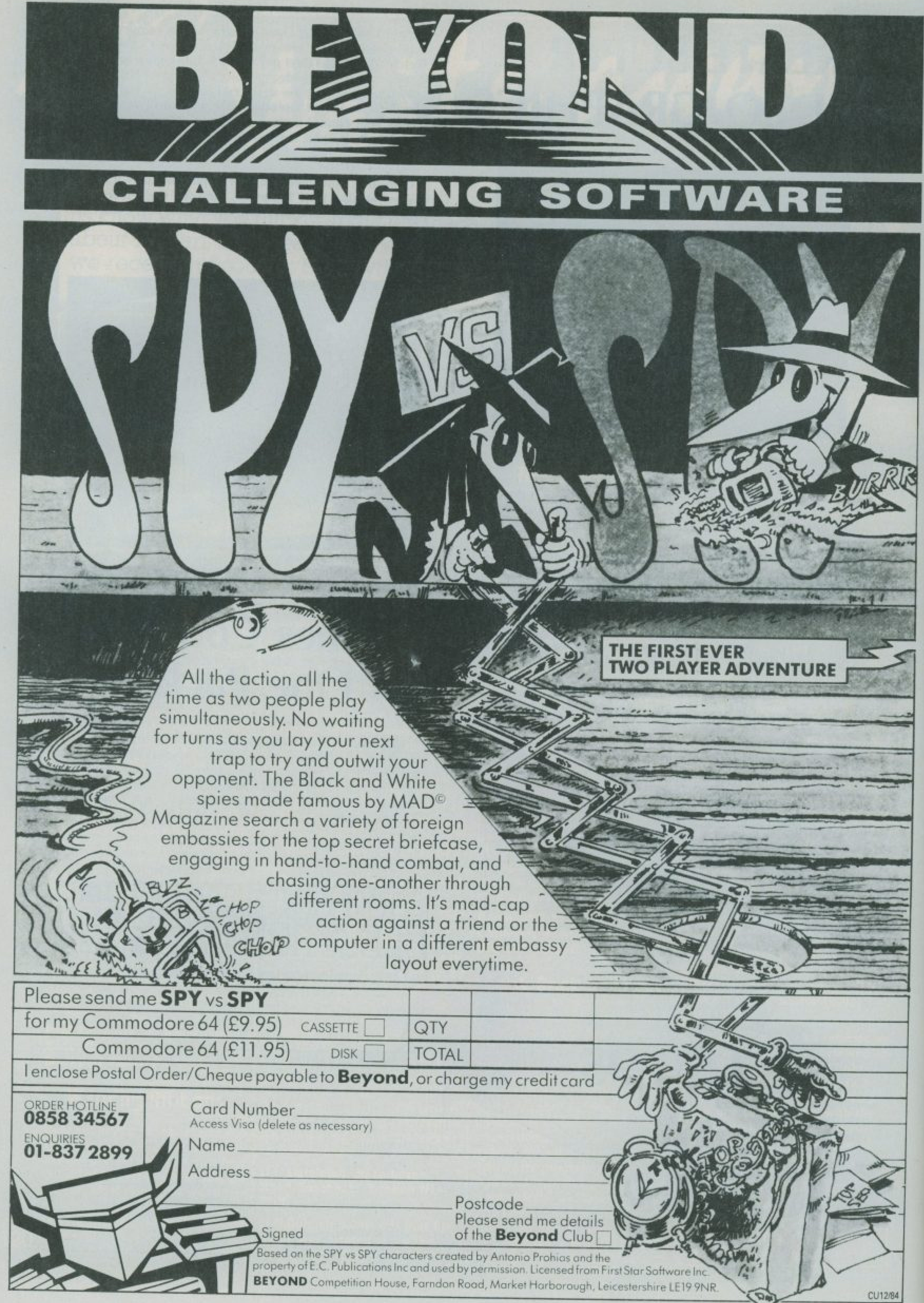
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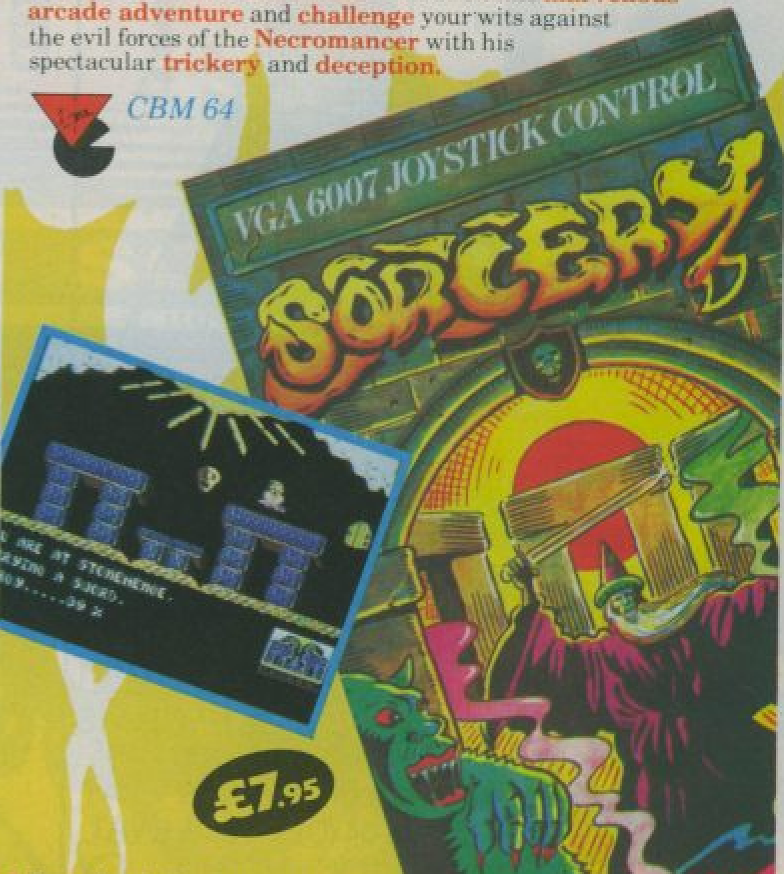
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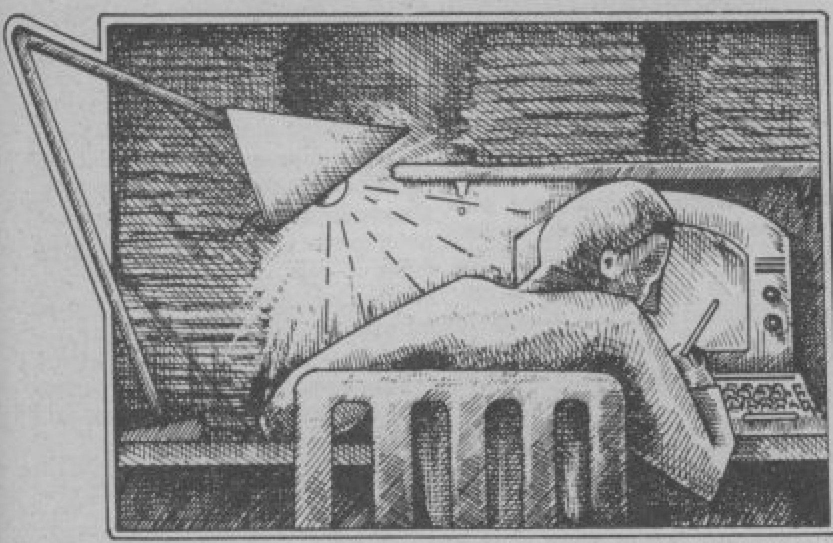
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TOMMY'S TIPS

Tommy is Commodore User's resident know-all. Each month he burrows through a mountain of readers' mail and emerges with a handful of choice queries. The result, before you, is a wadge of priceless information and indispensable advice. There's even the odd useful tip as well.



Dear Tommy, I am at the end of my tether. It seems that I am totally unable to get an answer from Commodore to my problem.

I have a Vic-20 and a Brother CE60 Electronic Daisywheel Typewriter plus its IF50 interface and its CA50-5 cable set (the machine accepts RS232 or Centronics). The lead has a 'D' 25 pin plug which the Vic-20 does not. How do I use the Vic-20 in RS232 to drive my word processing equipment? I have Vicwriter and Disk Unit. Why don't Commodore tell us more about the RS232 ability of the Vic-20, or is it all a filthy lie?

Please don't throw up your hands – please help me.

One of the most common problems I get asked about is how to connect two different manufacturers' equipment together so that they work as expected. The most pertinent piece of advice I can give is do not buy any equipment made by different manufacturers without:

a) asking for a demonstration that the equipment is compatible and

b) without making it a condition of sale that equipment X must be capable of working with computer Y when used with interface Z.

Failure to do either will almost certainly ensure that you are going to have problems at some stage. Even the so-called 'standard' RS232 interface has a number of variations, any one of which can prevent the two pieces of equipment from working straight away. Having spoken to a supplier of electronic typewriters I suggest you try the Stack RS232 interface at around £55 (the cheaper interface at £26 will not work apparently).

Unfortunately Vicwriter will not work with an RS232 printer connected to the User-port so if you intend using that, you will have to go for one of the serial-port to Centronics parallel converters such as the Vicsprint from Ram Electronics. I have not tried this combination, but see no reason why it should not work; however, before you order note the points I made at the start so that you can return it if it doesn't work!

Dear Tommy, I would like some information to help me use my Vic-20. Please could you tell me how many modes I have and how to get into a different mode? Also I would like to know what the function keys and Commodore key do. If you could send me this information I would be grateful.

I assume you are talking about 'modes' à la BBC? In which case the answer is ONE! You cannot set different screen widths or resolution by a simple command because Commodore Basic has not progressed since the days of the old Pet. However, all is not lost since there are ways of getting 'Hi-res' modes but these all involve a clear understanding of how they work and the amount of memory that has to be set aside before you can use them. The different modes available are:

1. Standard 22 col text and/or Commodore graphics (low-res)
2. Hi-res graphics mode
3. Multi-colour graphics mode

Many of the programs published in the magazine will give you an idea of using hi-res modes, but the easiest way is by using the **Super Expander** Cartridge from Commodore which gives you those elusive 'Mode' commands and allows plotting commands directly from Basic.

The function keys also do not have any real use without going into machine code programming unless you buy one of the cartridges which allow them to be set to pre-set strings, such as the **Programmers Aid** cartridge. They can of course be 'read' like any other key with a **GET A$**, which will return a value between 133 and 140.

Lastly, the CBM key is used in conjunction with the SHIFT key to change between upper and lower case letters plus restricted graphics set. It is also used as a 'control' key by a number of applications programs such as word processors. If you wish to test if it has been pressed during a program then address 653 will contain the value 2 while the CBM key is actually being pressed (or 3 if the SHIFT key is pressed at the same time).

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Dear Tommy, Please tell me how to make eight different sprite characters appear on the TV screen, at once. Every time I try, I get duplicate copies of the first sprite's data, the computer won't 'read' the second, third, etc. chunks of data.

I use a 'sprite builder' tape by Euro-Byte; could this have something to do with my problem?

Also is it possible to create more than eight sprites?

What you have to do after creating your sprites is to tell the computer where to find the information. The Sprite Data Pointers are the registers you need to set and these are at addresses 2040-2047. Each of these addresses must be set to the location of the *first* byte of data for your sprite; for example, if the data for sprite 0 is held from 12288 to 12350 then **POKE 2040,192** will set the data pointer (12288/64 = 192).

The next sprite will be stored from 12352 to 12414 and its pointer will be set by **POKE 2041,193**, and so on... What has happened in your case is that you appear to have set all the sprite data pointers to the same value. Hence you get all the same sprites; whether this is caused by the Euro-Byte program I have no idea since I haven't seen that one. If when you set up the different sprites you can display them individually and the problem only occurs when you transfer the data to your program then you will need to find out where the sprite information is being stored in memory and set the data pointers accordingly. As for creating more than eight sprites, you can store the data on as many as you like (memory permitting) although the data must be in the same 16K 'page' of memory as the screen area. The limitation is that without using machine code and interrupts you cannot *display* more than eight at a time since there are only eight sprite data pointers.

Dear Tommy, I have a few questions concerning Commodore's 1520 printer/

Tommy's Tips

plotter. Can the printer print user-defined graphics? If so, how can this be done? Is it possible to print the Vic-20's character set? If so, how can it be done? Which word processor supports the 1520? (if any!). Thank you.

The 1520 printer/plotter can only print the alpha/numeric characters that are contained in its ROM. This does not mean that you cannot send down the codes to actually draw the characters you require, but it is not possible to download these *en-masse* to the plotter for printing later on in the program; there is no RAM in which to store such characters. The way to do it is to design your characters on paper, working out the plotter movements required to draw them. These can then be stored (on disk or tape) and loaded into a multi-dimensional array for each program that needs to use them. You would then require a sub-routine which would pass the commands for the particular character to the plotter as a series of co-ordinates to be plotted.

I assume your second question refers to the Commodore graphics characters, in which case the answer is no; these characters are not included in the ROM based character set. If you try to print control codes for example, you will merely get underlined characters (pages 42/43 of the plotter manual refer to this).

Finally I do not know of any wordprocessor which supports the 1520. One of the reasons for this is that the device number is not that of a normal printer; most printers are set up as **device 4** on the serial bus, whereas the plotter is set up as **device 6**. Any normal command to the printer will be totally ignored by the plotter. I am afraid that if you want to use a WP program you will have to invest in a standard printer.

***Dear Tommy,* Can you tell me, please, whether a Commodore 64 made for the U.S. market can be used in this country? I bought a Commodore 64 in Seattle, and brought it back here; that it won't work with a U.K. television set I've already discovered, but would there be any problem with a colour computer monitor? Any help with this would be greatly appreciated, as I would prefer not to have to buy a whole new computer! Some method whereby I could interface my 64 with a U.K. monitor would be ideal. Also, could I use cartridges with my US machine?**

I am afraid that you have more than just a problem with a UK TV. For a start the power supply transformer will work on 115v, not 240v as in this country. Therefore do not attempt to plug the machine in using the existing transformer otherwise you will do irreparable damage to both it and the transformer. You can always try contacting Commodore to purchase a new power supply, although they are not noted for their willingness to supply such items separately; alternatively you could buy a step-down transformer to convert 240v to 115v.

Even then you have a second problem of timing. The US machines use a 60Hz timing signal, UK machines use 50Hz. This means that your machine will run slightly slower than normal; this is a minor problem for most applications however, unless you have a critical timing application. There is no reason why a colour monitor will not work, although you may again get slight problems from the timing difference. Finally, cartridges are universal and will run quite happily on your machine, provided you can overcome the more fundamental problems.

***Dear Tommy,* I have one or two questions on the "health" of my Vic 20 and Datassette. The power transformer heats up quite a lot. Is any damage possible from this overheating? Will my Vic be damaged in any way when the power transformer gets hot?**

When a program has been loaded and the wheels stop turning round, but "play" button is still down, is any damage done to the Datassette?

Now I have been having some more trouble with my Datassette or Vic. Only some programs load. Cartridges work, though. For example, Chariot Race (Micro Antics) and Tank Commander (Creative Sparks) won't load, but Chariot Race sometimes will load, but this is very rare. All Anirog games and LLamasoft games will load, every time. That goes for Tornado (QS) too. Why is this so? I've cleared the "heads" on my Datassette. I tried Tank Commander in the shop and at a friend's house. It worked then. Now I don't feel I can go out and buy a game, in case it won't load. Unless it's by Anirog (which produce very good games actually).

Finally, can all programs needing 8k expansion use 16k expansion? And could you tell me where the screen codes and screen colour codes begin and end on a 16k expanded Vic.

The simple answer to your damage question is no. However, if the transformer gets too hot to touch then this could indicate a fault, in which case you should return it to your dealer for checking. If it is just very warm then this is quite normal and no damage will occur. You should always ensure that you unplug it when you have finished with the computer though and not leave the transformer plugged in all the time; this can eventually cause it to fail.

The PLAY button on the cassette recorder can stay down without damage since the computer will turn the motor on and off as required. You should not leave the machine in this state when you have finished using it however, since this will cause distortion of the pinch roller and upset the tape speed.

You don't say how old your cassette is. I know of a number of people who have similar problems with the 'old-style' cassette. If yours is fairly new, then it could be the tape head alignment. If the programs you have saved yourself all load correctly, but some commercial ones don't, then see if your dealer will check out the head alignment and tape speed for you.

Finally, all programs that need 8k should run without problem using 16k; the screen and colour maps relocating at **4096-4607** and **37888-38399** respectively.

***Dear Tommy,* The other day I set about composing a program which had a timing element within it. I wanted the time to be shown to 2 decimal points, ie. hundredths of a second. The following program is basically what I used:**

```
10 PRINT"(CLR)"
20 T=0
30 PRINT"(HOME)"T
40 T=T 0.01
50 GOTO 30
```

On running the above program you can see the problem that I encountered. Please could you explain why this occurs, and how to remedy it.

You are suffering from a common ailment, called 'floating point inaccuracy'. Because floating point numbers are stored in binary format there is a limit to the size of fraction that can be held accurately, hence some numbers suddenly go a few thousandths higher or lower. The way to overcome the problem is not to store the number as a fraction, but store an integer value and then divide by 100 when you print it. Change lines 30 and 40 as follows:

```
30 PRINT"‹HOME›"T/100
40 T=T+1
```

***Dear Tommy,* Could you please tell me a little about integers and how they work as I don't know how, where and when to use them. I own a Vic-20. Thank you.**

Basically, 'integers' is just another way of saying 'whole numbers', that means numbers without any fractional part. Commodore computers always store numbers in a floating point format and then convert to integer if required. If you have a number which has a fractional part, for example 2.3, then converting it to integer (using INT(2.3)) will give the answer 2. As to how, when and where, it really depends on what you are trying to do.

If you store numbers in integer variables, for example DR%, then you are in fact wasting time since there is s double conversion every time you access the variable. However, an integer variable only occupies 2 bytes, whereas a floating point number occupies 5 bytes. Therefore if you are trying to cram a program into an unexpanded Vic-20 then using integer variables whenever possible will save space especially in array declarations. **DIM A%(5,5,5)** takes 250 bytes, **DIM A(5,5,5)** takes 625 bytes! If memory size is not a problem then stick to floating point variables for that little extra speed.

You are also limited to the values **−32768** to **+32767** in an integer variable (16 bits) whereas a floating point variable can store a much larger number.

Another use for integers is checking whether you have reached a certain multiple, within a loop for example. The following short piece of code will print 4 numbers across the screen before going on to the next row. It uses the fact that INT strips off the fractional part so that if you multiply the result by the same number you divided by, you only get the same number when it can be divided an exact number of times. Try running this simple program:

```
10 FOR A=1 TO 16
20 PRINT A;
30 IF   INT(A/4)*4=A   THEN
   PRINT
40 NEXT A:END
```

**Write to: Tommys Tips
Commodore User, Priory Court,
30-32 Farringdon Lane,
London EC1R 3AU.**

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CBM games for sale, £2.50; cartridges, £4.00; utility £4.00. Vic-20 cassettes and utility for £2.00. Send for free list (sae) to: S Findlay, 297 Blackwell Road, Carlisle, Cumbria CA2 4RW or tel 33694.

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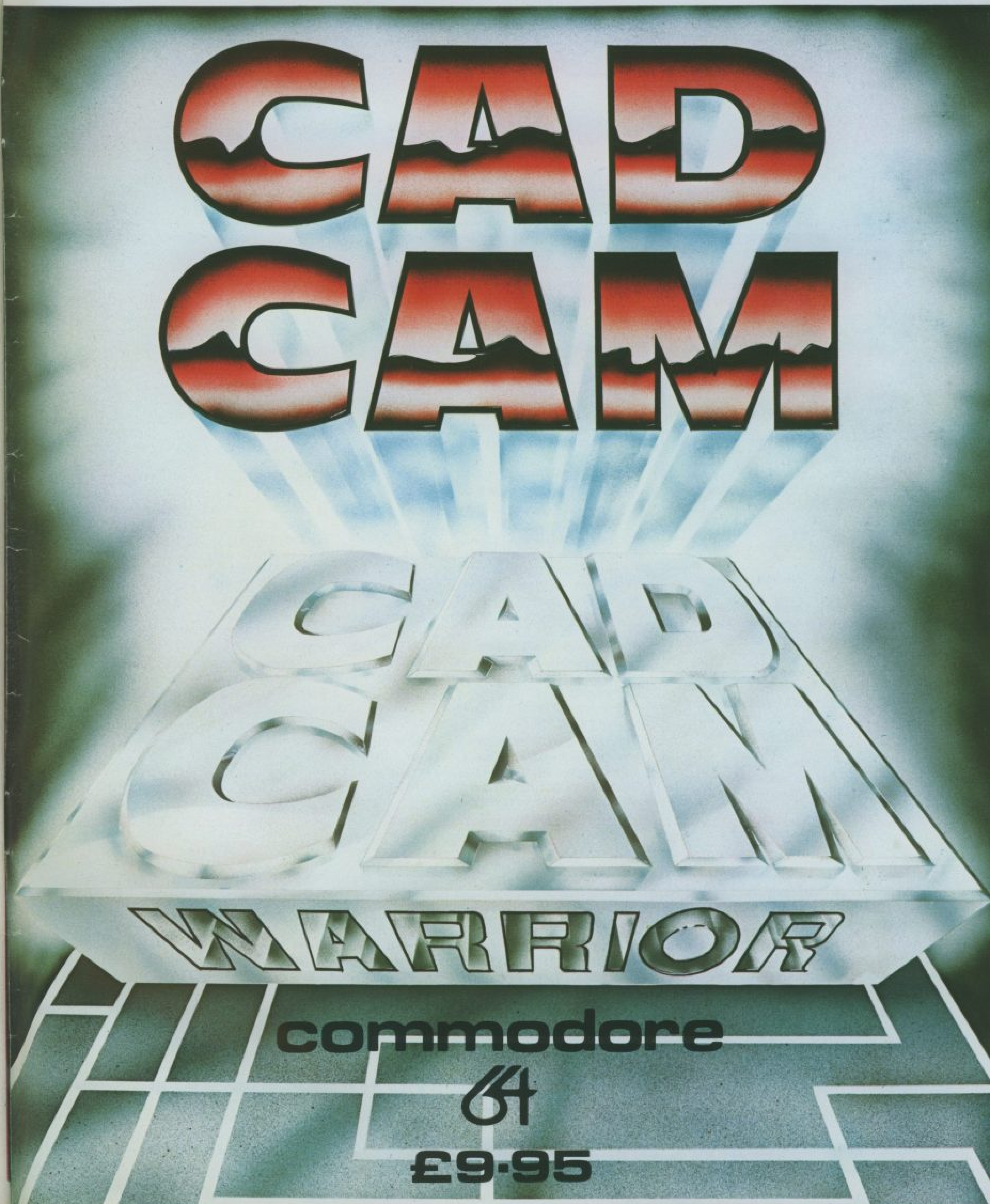
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